Back Bay National Wildlife Refuge
Croplands Management Plan

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Reviewed/Approved by:

for John Stasko, Refuge Manager
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(South Zone) — Hal Laskowski Date 9/20/99

Tom Stewart, Geographic Assistant
Regional Director (South Zone) — Thomas W. Stewart Date 3-5-00

John -
I signed this with some reservations about our farming program Region wide, i.e. why do we farm, biological benefits, croplands vs habitat, limited species benefit from farming versus multiple species benefit from moist soil mgt. etc. I expect there will be some major changes in the next 3-5 years!

TOM

BACK BAY NATIONAL WILDLIFE REFUGE CROPLANDS MANAGEMENT PLAN

I. INTRODUCTION

Back Bay National Wildlife Refuge (Back Bay Refuge/The Refuge) is located in Virginia Beach, Virginia. Virginia Beach is a combination of metropolitan resort city and rural areas. The largest contiguous portion of the Refuge is located on a barrier island, "sand spit", and is bordered by the town of Sandbridge on the north, False Cape State Park on the south, Back Bay (part of the Albemarle-Pamlico Estuarine Sound) on the west, and the Atlantic Ocean on the east. New land acquisitions since 1989 have added large tracts to the Refuge to the north and south of Sandbridge Road, and along the western sides of North, Shipps and Redhead Bays. The Refuge also owns several Back Bay Islands (Long, Ragged, and western heretofore unnamed islands).

Habitats consist of oceanfront beach and dunes, fresh to brackish marshes, mixed hardwood-softwood lowlands, managed freshwater (emergent marsh) impoundments, open water, poorly drained agricultural fields, and older forests. Back Bay provides freshwater to the Refuge's ten impoundments. Most of these habitats are below five feet mean sea level (msl). Much of the lowland forests have been cleared for agricultural use. All existing Refuge croplands have been acquired during the past ten years. Existing forested areas are currently unsuitable for agriculture.

II. HISTORY

A good summary of the history of Back Bay National Wildlife Refuge (the Refuge, Back Bay NWR, or Back Bay Refuge) exists in the Refuge "Station Management Plan" written in July 1993. Since that document serves as the "umbrella plan" for this and all other Back Bay Refuge management plans, that information will not be repeated here, unless directly applicable to this Cropland Management Plan.

Back Bay NWR was established because of the dense concentrations of migratory waterfowl that used the area during the late 1930's. Annual peaks of more than 100,000 snow geese were known to visit the Refuge during the 1940s. Since the 1970s, snow goose populations have dropped to an average annual peak of 10,000. Canada goose and tundra swan populations also reflected a similar decline during the same period. Changes in Back Bay water quality, a major decline in the bay's submergent aquatic vegetation (SAV) distribution, and increased land development (to both housing and agricultural uses), probably contributed to this decline. During the 1990's , although snow goose populations continued to decline, Canada goose, tundra swan, duck and shorebird numbers began to increase.

The Refuge is in the Atlantic Coastal Plain physiographic province. At the lower elevations the soils are very poorly drained due to the topography. The better drained sites are well adapted to agricultural crops. Sites with poor drainage are adapted to forage crops and small grains. Primary agricultural crops in this area consist of soybeans, corn, melons and wheat. Secondary crops include a variety of other vegetables, strawberries, and more recently cotton.
Until 1986, farming practices on Back Bay NWR had been limited to mowing, root raking, and

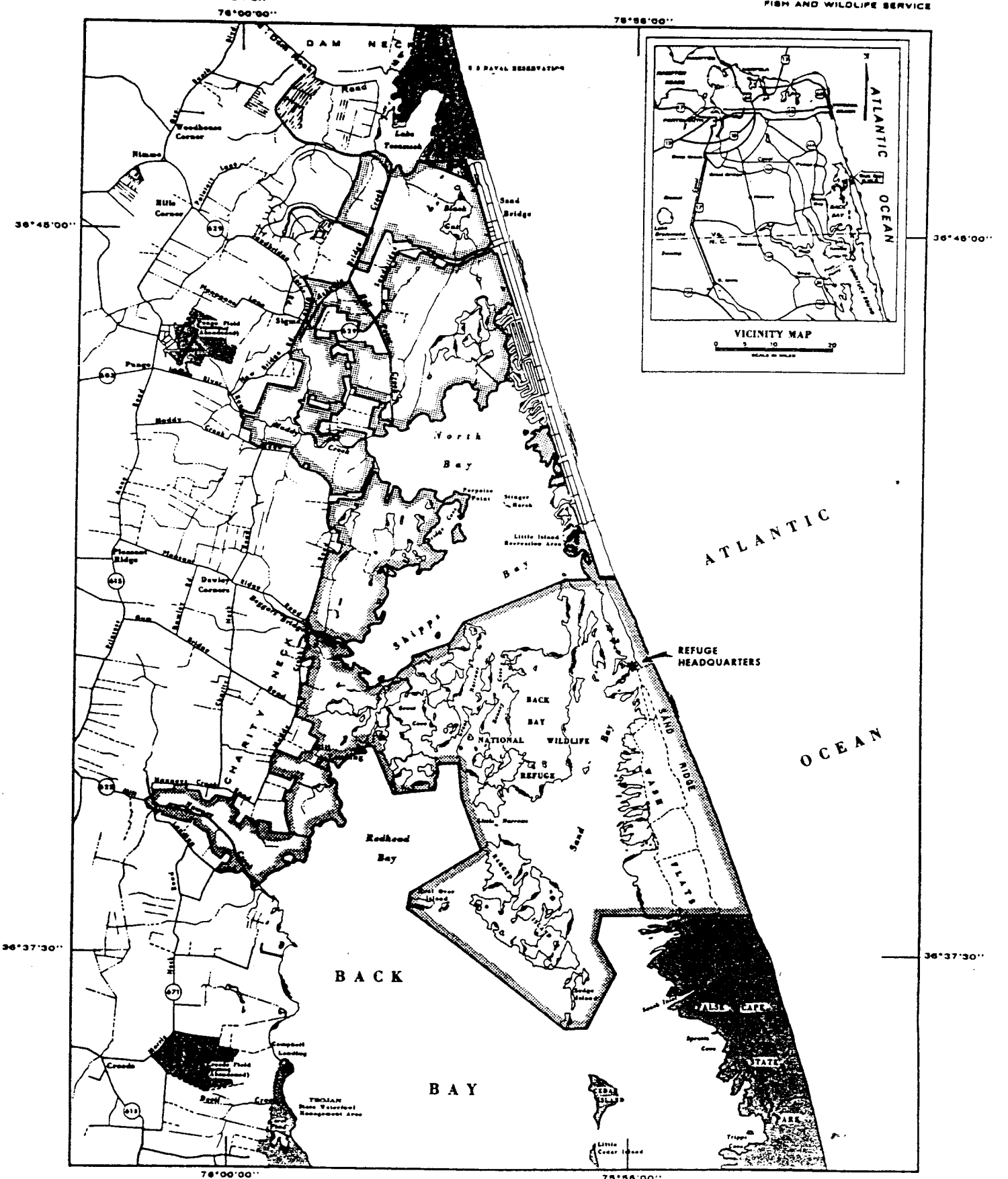
MAP #1

BACK BAY NATIONAL WILDLIFE REFUGE

UNITED STATES
DEPARTMENT OF THE INTERIOR

CITY OF VIRGINIA BEACH, VIRGINIA

UNITED STATES
FISH AND WILDLIFE SERVICE



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discing by Refuge staff, to set back vegetative succession in the impoundment complex. In 1989, 35 acres within these impoundments were planted with Japanese millet; winter wheat was also planted on Long Island then. Afterwards, Long Island was farmed and managed for Ladino clover, with difficulty; since barge access was limited by bay water levels and weather.

During 1989, the Refuge acquisition boundary was expanded to include 6,340 more acres to the north and south of Sandbridge Road, north of North Bay, and along the western sides of North, Shipps and Redhead Bays. During May 1990, Back Bay Refuge commenced land acquisition in these new areas. The Refuge has since acquired 3,626 acres of which approximately 240 acres were agricultural fields or croplands. A good understanding of how best to manage those lands is still being developed. In the meantime, it was decided that maintaining those habitats in their current early-successional state was the best way to temporarily manage the croplands - until a long-term objective could be arrived at.

The Refuge presently consists of approximately 8,000 acres. Refuge agricultural fields are important wildlife management tools. Historically, these lands provided food for the greater snow goose, Canada goose, and dabbling ducks. Due to the reduced numbers of those waterfowl currently visiting the Back Bay area, waterfowl use of these fields is reduced. However, the trend during the past 2 - 3 years has been towards gradually increasing wintering waterfowl use of the Back Bay Refuge vicinity, particularly by the coot, gadwall, wigeon, pintail, and Canada goose. The increase has been most noticeable in bay areas with corresponding increases in SAVs. Some new waterfowl use has also occurred in farm fields near Nawney Creek. The 256 acres of Refuge presently in controlled agricultural states can play an important role in attaining Refuge wildlife management objectives.

III. OBJECTIVES

A. General

Cropland management objectives at Back Bay Refuge are as follows (from 6RM4.2):

1. Provision of nest and/or winter habitats for migratory birds. This may be accomplished by conversion of some actively farmed fields to forest/wetlands for more efficient wildlife management of previously farmed fields (once better wildlife management objectives have been defined). Such a conversion (ie.- reforestation or wetlands restoration) might also meet "Reduction of soil erosion" and "Improvement of the soil through addition of nitrogen and organic matter" objectives.
2. Increased acreage of early successional (ie. grasslands) field habitats for greater bird use and biodiversity.
3. To curtail undesirable brush and tree invasions (until specific management objectives have been defined, based on wildlife/plant/habitat surveys). It may be necessary to keep such newly acquired fields open through farming, until they have been inventoried, and proper land use plans/policies are developed.

4. Provision of songbird use habitats, particularly along cropland edge areas and in fields dedicated to songbird food production or nesting.
5. Reduction of waterfowl depredations on surrounding, privately-owned lands.
6. Assurance of economic incentives for cooperating farmers (ie. production of crops in excess of wildlife needs is retained by cooperating farmers).
7. Research and demonstration of farming practices (BMPs) that are good for both wildlife and farmers. This may include setting up Refuge "Demonstration Areas" aimed at providing good farming practices and wildlife protection and preservation (ie.- Integrated Management Planning and No-Till Farming).
8. Production of supplementary grain for use by migrating and wintering migratory birds.

B. Relationship to Refuge Master Plan and Refuge Objectives

1. Refuge Master Plan - According to the Refuge Manual (6RM4.1), Service policy includes using the most natural means available to achieve Refuge wildlife management objectives. In some cases, Refuge policies/objectives must include socio-economic, and/or land acquisition concerns, both on and off the Refuge. If Refuge objectives cannot be met through natural ecosystems management, a more intensive, a cropland management method may be employed, until defined wildlife management objectives are developed via a thorough habitat/wildlife inventory. The acreage devoted to croplands will be the minimum required to meet such approved objectives. Service policy also requires that the long term productivity of the soil not be jeopardized to achieve Refuge wildlife management objectives.

2. Refuge Objectives - A primary objective of Back Bay National Wildlife Refuge is to provide opportunities for migratory birds to feed, rest, and/or nest in the area. An element of this objective is the provision of feeding and resting areas for migratory waterbirds, during the fall and spring migrations, and throughout the winter. Much of this food is supplied by the wetlands of Back Bay and the 880 acre Refuge impoundment complex. Planted crops furnish additional food for such waterfowl as the Mallard, Black duck, Pintail, Gadwall, Wigeon, Snow goose and Canada goose.

This objective also includes use and production by other migratory birds (ie. passerines, raptors, etc.). Some Refuge agricultural fields may be farmed to songbird-seed-mix crops. Others can be let go to a "mid-old-field successional stage", to provide feeding and nesting opportunities for such declining neotropical passerines as the Indigo Bunting, Blue Grosbeak, Field Sparrow, Bobolink and Gray Catbird, together with other migratory birds (warblers, thrushes, vireos, sparrows, hawks, etc.). Other agricultural fields may be managed as grasslands, with emphasis on grassland nesting passerines (Savannah, Grasshopper and Swamp sparrows, etc.). Management of these grasslands and mid-successional fields for songbirds may include prescribed burning as a management tool, in addition to the usual agricultural mowing, bush-hogging and discing.

Furthermore, the use of previously farmed, open fields for crop production, maintains them as open fields or grasslands, and retards natural vegetative succession (to shrubs and woodlands) until specific policies can be developed on what the proper use of that land for the wildlife resource should be. Often, this takes time and planning before the inventories and surveys necessary to determine current wildlife and plant use of that area are carried out. If natural succession is permitted, future management actions would have to include additional expensive costs for shrub and tree removal. Therefore, it may be necessary to permit farming as a short-term management tool that maintains a field in the current open state, retards shrub and tree encroachment, while also providing the Cooperative Farmer with income and supporting the local farming industry. Once the proper inventories and surveys have been carried out that determine what the current use and wildlife value of the field and surrounding vicinity is, and what the best management direction should be, then farming may be redirected elsewhere or ceased.

Open agricultural habitats and adjacent natural areas, maintained by this plan provide the following:

- Nesting and feeding areas for waterfowl
- Nesting and feeding areas for neotropical passerines, other passerines, and shorebirds along edge areas.
- Feeding areas for nonmigratory birds and deer.
- Hunting areas for avian raptors and native mammalian predators.
- Feeding and nesting areas for small mammals.
- Positive public relations with the surrounding farming community.

Previous Refuge objectives have supported more specific goals including: (1) providing winter browse for Canada and Greater Snow geese; and (2) providing biodiversity for other migratory birds, small mammals, and large mammals; and (3) Grain Production. Those objectives are hereby changed and superceded by the following objectives as follows:

a. *Fall - Winter Browse and Nesting Habitats* - Grain production and waterfowl browse objectives must also consider the following issues:

- Historically, Snow and Canada geese, and the Tundra swan have caused depredations on agricultural crops. Should there be a buildup of these waterfowl on Back Bay NWR, efforts should focus on preventing off-Refuge depredations, and containing such impacts to the Refuge
- Use of Refuge Ladino clover fields by Snow and Canada geese was encouraged in the past. Management objectives of those fields have recently shifted from geese to grassland/shrubland songbirds, since those geese are no longer a priority in the northeast.
- Winter wheat will be available as goose browse in agricultural fields #s1, 2, 7, 8 and 14, to offset land management changes that might cause wintering geese to seek food on non-Refuge, agricultural, private properties.

b. *Providing Biodiversity & Other Objectives* - Fields planted with Songbird seed mix (#s 3,10, and 13) will provide food for migrating passerines that use early and mid-successional, Refuge fields during the wintering and breeding seasons. Mid-successional field (#s 11 and 12) management will consist of periodically (every 3-5 years) setting vegetative succession back in sections of each large field that is not being farmed to cash crops; so that as much as possible of each field is kept in a mid-successional state for the longest time period without losing the field to trees. Management options may include prescribed burning, mowing and/or bush-hogging, to retard old-field succession.

A "sensible approach" to maintenance of Refuge biodiversity should be emphasized, and be determined in conjunction with the Refuge Manager, Virginia State Biologists, and the Regional South Zone Biologist. By a sensible approach is meant in keeping with the "big picture"; as concerns the most needed habitat types that Back Bay Refuge can supply. In some cases, reforestation of some fields would be the best option, should existing fields be contributing to fragmentation of a surrounding, large, contiguous forested habitat. In other cases, there may be a particular Regional habitat need that can be met at Back Bay NWR, that can supply a Regional management priority (ie. large deciduous forested tracts for Red-cockaded Woodpecker reintroduction; large grasslands tracts for declining neotropical passerines; wetlands restoration to replace marsh that was lost when the land was first drained and farmed; etc.). This "sensible approach" should also include close scrutiny to insure that increased biodiversity is not also contributing to harmful habitat fragmentation.

c. *Grain Production* - Grain (corn, soybeans and winter wheat) production objectives are listed in the Cooperative Farming Agreement (Appendix A). One hundred percent of this "cash crop" harvested from fields # 1, 2, 7, 8 and 14 will be retained by the cooperative farmer, in return for maintenance of other Refuge fields (# 3, 6, 9, 10, 11,12, and 13) and moist soil units of the impoundment complex for wildlife use (ie. bush-hogging, mowing, discing, dike maintenance, etc.). During wildlife depredation in a Refuge field allotted to the cooperative farmer, the cooperative agreement will be re-negotiated to compensate for the farmer's losses. (Refer to Cooperative Farming Agreement for grain production rate.) Waste grain in harvested corn and soybean fields will provide food for geese, ducks, other migratory birds, and resident wildlife.

C. Objective Accomplishments

The 1999 - 2000 Refuge Cooperative Farming Agreement (Appendix A) details when a specific crop will be grown on the respective field. Each year a summary evaluation of the farming program will be included in the annual narrative report. This summary should include a discussion of soil test results, crop yields, herbicide use, and waterfowl or any wildlife use within the cropland units. All

other fields will be evaluated as detailed in the objectives and below summary. Changes to how the objectives and evaluations are accomplished on a field-by-field basis, are permitted when the need arises, as long as those changes are in keeping with the objectives of this Plan. Should monitoring determine that the field objective is not being met, a new use for that habitat should be established.

In summary, the Cropland Management Plan objectives of section IIIA above, will be met as follows:

1. Fields # 1, 2, 7, 8 and 14 (Ref. Map #2) are managed as cash crop fields, and meet objectives 3 - 8. Most of Field #7's status will convert from cash crop field to wetlands for waterbird use during 1999-2000, due to wetlands restoration efforts on about 25 acres there. The remaining 10 acres will continue to be farmed to a cash crop.
2. Fields # 3, 10, and 13 may be managed for songbird seed mix, and meet objectives 1, 4 and 8.
3. Fields # 6 and 9 may be managed as grasslands and meet objectives 1, 2, 3, 4 and 8.
4. The remaining fields, # 11 and 12, may be managed as "mid-successional fields." Mid-successional fields meet objectives 1, 4 and 8.
5. The above objectives may be modified with an amendment to this Plan, should future management and biological needs and priorities change.

IV. MANAGEMENT AND FARMING UNIT DESCRIPTIONS

A. General

The major Refuge cash crops are corn, soybeans, and winter wheat. The Refuge farming program has been conducted on 256 acres. Given the addition of adequate fertilizer and lime, high corn and soybean yields are possible during years of normal precipitation. Therefore, corn, wheat, and soybeans have been rotated on 133 acres, according to the season. Another 65 acres are grasslands for use by grassland avian species. An additional 48 acres are being farmed as "mid-successional fields" for passerine nesting; while the remaining 10 acres are planted to mixed songbird seed. Because of the small cropland acreage, the Refuge probably has little impact on the overall local agricultural economy. However, the Refuge acreage is important to the small number of local cooperative farmers, since it enables them to farm additional land near home and supplement their incomes.

Due to barge transportation difficulties for farm tractors, it is not feasible for Long Island to be managed by Refuge Force account, nor by the Refuge Co-operative farmer. Currently, the Long Island fields are overgrown with forbs and shrubs. Past goose use was infrequent and insufficient to warrant continued farming of this remote area. The fields should instead be permitted to reforest.

B. Unit Descriptions

1. Physical - The agricultural land on the Refuge is divided into thirteen cooperative farming units (FUs), as described below in Table 1. Refuge farm units are geographic units, established for reference and not operational purposes.

Table 1 - Refuge Cooperative Farming Units

Farm Unit	Field #	Acreage
Tract 150a, Sweet Farm, Colchester Road	1	24
Tract 163, 1820 House, Muddy Creek Road	2	22
Tract 201, Muddy Creek Road	3	5
Tract 125a, Reforestation Site, Sandbridge Road	6	25
Tract 141, Sandbridge and Colchester Roads	7	10
Tract 166, Currence, Muddy Creek Rd.	8	24
Tract 104, Hunt Club, Sandbridge Road	9	40
Tract 167, Muddy Creek Road	10	1
Tract 108, Sandbridge Road	11	10
Tract 194, Muddy Creek Road	12	38
Tract 225, Nawney Creek Road	13	4
Tract 205, Henley Muddy Creek Road	14	18
	Total Acres	221


BACK BAY
SCALE IN MILES
0 1/2 1 2
MAP #2
ALEXANDRIA DRAFTING COMPANY
N
S
E
W
= REFUGE CROPLANDS
FIELDS AS OF AUGUST 1999
FIELD#11
FIELD#9
FIELD#6
FIELD#7
FIELD#1
FIELD#10
1820 Hse
FIELD#2
FIELD #8
FIELD #12
FIELD#3
FIELD #14
FIELD#13
Sandbridge
Pungo
RIVER
ANNE RD
RD 672
NEW BRIDGE RD
SAND
BRIDGE
629
615
671
622
699
NORTH MUDDY CREEK
1820 Hse
HORN BLOW RD
STUART RD
PLEASANT RIDGE
Pleasant Ridge
DAWLEY RD
GUM BRIDGE RD
NECK
CHARITY
MUDDY CREEK RD
SHIPPS CABIN RD
DRUM POINT RD
NAWNEY CREEK RD
Nawney Creek
Back Bay
LANDING RD
MORRIS
STONE RD
BACK BAY (C)
BRIGHTS RD
CAMPBELL RD
FITZTOWN RD
BACK BAY LANDING
Sandbridge Marsh
NORTH BAY
Porpoise Pt
Stinger March
Bridge Cove
Little Island Creek
LITTLE ISLAND CITY RECREATION AREA
Staging area for False Cape State Park &
Barbours Hill Wildlife Management Area
ATLANTIC
OCEAN
Bread Is
SHIPPS BAY
Great Narrows
Walkes Pt
Auger Is
Sams Cove
Beggars Bridge Creek
Great Cove
REFUGE
Shell Is
Mose Is
Shermans Pt
Gallbush Pt
Mose Island Pt
Little Narrows
REDHEAD BAY
Heaven Pt
SAND BAY
Drum Pt
Rock Is
Rock Pt
Horse Pt
Campbell Landing
Cornick Pt
BACK
Sandy Pt
BARBOURS HILL BOAT DOCK
South Inlet
South Pt
FALSE CAPE STATE PARK & BARBOURS HILL WILDLIFE MANAGEMENT AREA
Spratt Cove
Spitt Pt
Home Pt
Big Is
FALSE CAPE LANDING BOAT DOCK
Green Pt
Little Cedar Is
Walkes Pt
Devils Creek
TROJAN WATERFOWL MANAGEMENT AREA
Rowdie Pt
POCAHONTAS TROJAN HEADQUARTERS
Pellitory Pt

2. Soil Types/Descriptions - The Soil Conservation Service mapped the soils within the City of Virginia Beach in 1985. A copy of the soil survey prepared by the city of Virginia Beach (Hatch, et al. 1985) is on file in the Refuge headquarters office. Information presented here is from that publication.

The primary associations found within the Refuge include Acredale-Tomotley-Nimmo, Back Bay-Nawney, and Newhan-Duckston-Corolla (Back Bay National Wildlife Refuge. 1993). The soils in Refuge farming units vary from poorly drained to well-drained. The most common Refuge soil type is Back Bay-Nawney. This soil is very poorly drained with a thin organic surface layer over a loamy substratum formed in fluvial sediments.

Long Island is a combination of Back Bay and Munden-Bojac soil types. These soil types consist of somewhat poorly drained to well drained soils with a loamy subsoil formed in marine and fluvial sediments. The farming units located on or near Sandbridge Road have a combination of soils: Tomotley-Nimmo poorly drained soils with a loamy subsoil formed in marine and fluvial sediments; and a combination of State-Tetotum well drained to moderately well drained, and somewhat poorly drained soils, with a loamy subsoil formed in marine and fluvial sediments. Some farming units on Muddy Creek Road have Dragston and Munden soils; somewhat poorly drained, moderately well drained, and well drained soils, with a loamy subsoil formed in marine and fluvial sediments. Other farming units on Muddy Creek Road have Augusta - Tetotum well drained, moderately well drained, and somewhat poorly drained soils with a loamy subsoil formed in marine and fluvial sediments. Table 2 lists the farming units and their associated soil types.

3. Topography - The flatness of the land surrounding Back Bay is the principal topographic characteristic of the watershed. Pungo Ridge runs along Princess Anne Road and has the highest land elevations along the western side of the Bay; reaching 15'- 20' above mean sea level (msl) at several points (Back Bay National Wildlife Refuge.1993). The better drained uplands exist along this ridge. Their elevations gradually subside eastward towards Back Bay, to about five feet msl. The lowest elevations are located on the upper edge of the flood plain. This ecotone is where the principal marshes and swamps of the Bay are found; however, crops are farmed throughout the higher elevations of the flood plain where the soils dry out readily or are drained via ditching. Because of the flatness and low elevation of the land, flooding from wind tides is a frequent problem for local farmers, particularly below the three or four foot contour elevations (Back Bay National Wildlife Refuge 1993).

Table 2 - Farming Units and Soil types

Farm Unit	Field #	Acres	Soil Number(s)	Soil Description
Tract 150a, Sweet Farm, Colechester Rd	1	24	13 38	Dragston fine sandy loam Tomotley loam
Tract 163, 1820 House, Muddy Ck Rd.	2	22	13 19	Dragston fine sandy loam Munden fine sandy loam
Tract 201, Muddy Ck Rd.	3	5	13	Dragston fine sandy loam
Tract 125a, Reforest. Site	6	25	13 19	Dragston fine sandy loam Munden fine sandy loam
Tract 141, Sandbridge & Colech. Rds.	7	45	7 19 34A	Bojac fine sandy loam Munden fine sandy loam State loam, 0 to 2 % slopes
Tract 166, Currence, Muddy Ck Rd.	8	24	3 36	Augusta loam Tetotum loam
Tract 104, Hunt Club, Sandbridge Rd	9	40	13 19 38	Dragston fine sandy loam Munden fine sandy loam Tomotley loam
Tract 167, Muddy Ck Rd.	10	1	13	Dragston fine sandy loam
Tract 108, Sandbridge Rd	11	10	13 24	Dragston fine sandy loam Nimmo loam
Tract 194, Muddy Ck Rd.	12	38	13 19 24	Dragston fine sandy loam Munden fine sandy loam Nimmo loam
Tract 225, Nawney Ck.	13	4	24	Nimmo loam
Tract 205, Muddy Ck Rd.	14	18	24 38	Nimmo Loam Tomotley Loam

C. Crop Rotations & Other Agronomic Practices

In an effort to break-up insect life cycles, enhance weed control, and improve soil fertility and texture, a seasonal crop rotation plan for cash crop fields is maintained using corn (summer), soybeans (summer/fall), and wheat (winter). Corn planted in the summer provides a cash crop for the farmer. When the corn is harvested in the late fall or early winter, the waste grain from the harvest provides early waterfowl migrants with a high carbohydrate or "hot" food. This should reduce depredation of privately owned farmlands. During winter, young winter wheat sprouts provide browse for wintering snow and Canada geese. A soybean crop alternates with the corn crop in the second year of the rotation.

1. Corn and Soybeans - As many acres as possible will be farmed by the cooperative farmer(s) for corn and soybean cash crops. Corn and soybeans are rotated annually during the spring and summer of the second year. The Refuge share includes farming by-products that benefits the wildlife resource and are provided by the cooperative farmer. Examples include: corn for waterfowl banding, waste corn/soybeans for migratory bird feeding.

Corn and soybean growing methods are the same as on private farmlands, although less use of chemical herbicides and insecticides is encouraged. Mechanical harvests normally results in approximately 5% of the crop yield left for wildlife use. Crops are rotated on a seasonal basis.

2. Wheat - Winter wheat should be planted on the same number of acres planted to corn or soybeans in during the late fall-early winter, as a cash crop for the cooperative farmer. Excessively wet conditions may prevent field access by farming equipment; therefore, there may be some years during which it is too wet for the farmer to plant winter wheat. When planted, winter wheat may attract wintering snow geese and Canada geese as green browse. The cooperative farmer must not discourage geese from using these fields. As explained in the Cooperative Farming Agreement (Appendix A), if goose depredation occurs, the Refuge will make restitution to the cooperative farmer for damage incurred.

3. Grasslands and Songbird Seed Mixes - Grasslands and songbird seed mix are maintained on 75 acres to provide forage for wintering waterfowl, passerines and mammals. Songbird seed mix and grassland plantings in Farm Units # 3, 6, 9, 10, and 13 will be permanent wildlife browse areas. These fields will be managed by the cooperative farmer who will tend the fields as directed in the Cooperative Farming Agreement (Appendix A).

Grasslands will be managed in an early successional stage, and consist of native grasses without shrubs or trees. Grasslands will be managed in as large a contiguous block as possible, and where possible will be allowed to grade into adjacent wetlands areas. Trees and brush will be removed from such grasslands areas, so that a continuous, grasslands effect is maintained. Interruptions of the grasslands terrain by "obstacles" will discourage use by target grasslands nesting passerines. Such "obstacles" may consist of old man-made structures, or building ruins, or scattered trees and brush in the middle of a field, or between a field and an adjacent marsh. For a grasslands to remain functional for nesting passerine

target species, those "obstacles" should be removed. Mowing, bulldozing, bush-hogging and prescribed burning are permitted as tools for maintaining grasslands conditions; together with limited, approved herbicide applications for removal of undesirable plants (ie. Johnsongrass, Phragmites reed, etc.). Monitoring of these fields by a qualified expert in passerine identification will be carried out seasonally to determine whether grasslands use objectives are being met.

4. Mid-successional Fields - Mid-successional Farming Units will also be managed by the cooperative farmer, as directed in the Refuge Cooperative Farming Agreement, and section B.2.b. of this plan. These fields will be allowed to succeed to forb and shrubland states for use/nesting by declining passerine species (ie. Field sparrow, Bobolink, Henslow's sparrow, Blue Grosbeak, etc.). They will be periodically cleared in the most efficient manner (ie. strip-mowing, strip-burning, etc.) that results in the most mid-successional stage acreage being available for target passerine use over the long-term. Monitoring of those fields by a qualified expert in passerine identification will be carried out seasonally to determine whether mid-successional field use objectives are being met.

D. Fertilizer

It is important to maintain the soil fertility of the Refuge and adjacent lands. Minimum fertilizer requirements are specific in the cooperative farming agreements for all agricultural crops grown on the Refuge by the co-op farmer: Stalks, straw, and other crop residues are plowed under to increase the soil's humus content.

Fertilizer use will be discussed with the farmer prior to crop-plantings, be in accordance with soil testing recommendations, and be incorporated into the Cooperative Farming Agreement. The amount of fertilizer to be applied will be determined by soil testing results from the Agricultural Department Farmer Assistance Program. Minimum fertilizer requirements are specified in the cooperative farming program (Appendix A).

E. Tillage

Cropping systems incorporate no-till or minimum tillage practices (turning over the soil) on all farming units. Implementation of no-till is not possible on cash croplands, since the ground must be turned over once or twice a year to accommodate the crop rotation, due to local soil conditions. However, other lands in grassland, bird seed or mid-successional management regimes can accommodate both no-till and minimum tillage practices annually. Such management will reduce soil erosion, encourage the retention of nitrogen and organic matter in the soil profile, is economically feasible, and should increase available forage. Guidelines established should be flexible enough to avoid direct force account and contract farming.

V. PROGRAM POLICIES AND GUIDELINES

A. "1996 - 1997 Cooperative Farming Agreement" Guidelines

Additional policies and guidelines governing soil treatments, pesticide use, waterfowl use of crops, wetlands restrictions, rental rates, record-keeping, etc. should be included in the "Special Conditions" (A through G) section of the Cooperative Farming Agreement. Those conditions are hereby incorporated as part of this section of the Croplands Management Plan, with the understanding that sections B, E & G will be subject to change. Incorporation of those Special Conditions is only intended to provide general guidelines for this Croplands Management Plan, and not to bind future Agreements or Plans to those conditions. The Cooperative Farming Agreement is intended to be the vehicle for specific, hands-on management changes to the Refuge Cooperative Farming Program.

A fundamental requirement to this Refuge farming effort is that there be a direct or indirect benefit to Refuge wildlife resources. Such benefits may be in the form of grain (either harvested and/or left in the field), as browse, food plots, cover crops, or other less tangible farming benefits, such as green manure cropping, liming, and fertilizing, that enrich the soil.

B. Crop-Sharing Negotiation

Most, if not all of farming on Refuge lands is done by a local farmer(s) on a cooperative basis. Refuge force account farming operations do not currently exist and are not encouraged, because of limited Refuge staffing.

Cooperative farmers are selected in accordance with 5RM17 of the Refuge Manual. General and special conditions governing their farming operations, as well as specific share assignments are documented in the Refuge Cooperative Farming Agreement (Appendix A).

The following criteria should be employed when entering into a new agreement:

1. Refuge crop shares should equate to the total rental rate charged to the cooperative farmer for all Refuge farm units under cultivation to cash crops.
2. Long term agreements of no less than 2, and up to 5 years, should be enacted when possible.
3. Prevailing market prices for crops, field rental rates, farming practices (ie. mowing, discing, planting, etc.) should be identified and applied in the best interest of the refuge and cooperator.
4. Current USDA cost-sharing programs should be assessed for their benefit to the refuge and cooperator.
5. The best practical conservation tillage techniques should be evaluated for cost effectiveness, and their ability to support refuge objectives.
6. Wetlands restoration projects involving prior-converted (PC) wetlands will have priority over Refuge farming programs. PC wetlands being farmed can be withdrawn from the co-op farm program and be converted to wetlands once again.

C. Procedures & Considerations for Establishing Shares/Ratios

The general procedure for determining crop shares is as follows:

1. The cooperator is allotted a number of farm units/acres on which to grow a specific cash crop (corn, wheat or soybeans).
2. The total rental value of this cash crop acreage is determined. The average per acre rental for similar farmland in the area is used after discussion with the Agricultural Extension Agent. Adjustments may be made for estimated loss to cash crops from wildlife depredation.
3. The cooperator is assigned the farm unit/acreage to plant in the specified crop, or other farming service/practice. The total value of services provided will be equal to the total rental rates of the cash crop. The value of the service is obtained by using the latest farm operation rates compiled by the Agricultural Extension Service and current local prices for seeds, fertilizers and lime. Table 3 below identifies refuge share objective levels for each Farming Unit ("Cooperator's Share and Government Share").

D. Annual Pesticide Use Proposal and Use Report

Pest control, either chemical or mechanical, in cash cropland is the responsibility of the cooperative farmer. Mechanical control includes use of discs, cultivators, and rotary hoes. Chemical control includes applications of man-made herbicides and insecticides. The herbicides permitted are specified in the farming agreement. Insecticides are to be applied only during a documented crop-threatening insect pest outbreak. Cooperative Extension agents are to be consulted for recommendations and Regional Office approval is obtained prior to such applications.

In the past, Annual Pesticide Use Proposals were submitted to the Regional Office, and approved, for use of "Beacon" (Sulfonylurea) in post-emergent control of Johnsongrass (Sorghum halepense) in corn. However, the Refuge Cooperative Farmer no longer uses this pesticide, instead opting to use less restricted pesticides listed in 7RM14.2A.4. Therefore, a Pesticide Use Proposal is not currently required for this station.

A list of pesticides requested for use by the Refuge Cooperative Farmer is included in the Special Conditions, section B, of the Cooperative Farming Agreement (Appendix A). All can be approved by the Refuge Manager, in accordance with 7RM14.2.

The co-op farmer submitted a Pesticide Use Report for pesticides used during 1998. A copy of that report, as submitted to the Regional Office, is included as Appendix D. Pesticides and Herbicides used by the Refuge Cooperative Farmer then, were as follows: "Blazer" (Aciflurofen), "Brasagran" (Bentazon), and "Dual" (Metolachlor).

Table 3 - Back Bay NWR Crop-sharing Objectives

Farm Unit	Field #	Crop or Crop Group	Cooperator Share (%)	Government Share (%)	Acreage
Tract 150a Colechester Rd	1	Corn, Wheat & Soybeans	100[1]	--- ---	24
Tract 163 Muddy Ck.Rd.	2	Corn, Wheat & Soybeans	100[1]	--- ---	22
Tract 201 Muddy Ck Rd.	3	Songbird Mix	--- ---	100 100	5
Tract 125a Sandbridge Rd	6	Grasslands - 1999 Grasslands - 2000	--- ---	100	25
Tract 141 Sandbridge Rd	7	Corn, Wheat & Soybeans	100[1]	---	10
Tract 166 Muddy Ck Rd.	8	Corn, Wheat & Soybeans	100[1]	---	24
Tract 104 Sandbridge Rd	9	Grasslands - 1999 Grasslands - 2000	--- ---	100	40
Tract 167 Muddy Ck Rd.	10	Songbird Mix	---	100	1
Tract 108 Sandbridge Rd	11	Mid-Successional Field	---	100	10
Tract 194 Muddy Ck Rd.	12	Mid-Successional Field	---	100	38
Tract 225 Nawney Ck Rd	13	Songbird Mix	---	100	4
Tract 205 Muddy Ck Rd.	14	Corn, Wheat & Soybeans	100[1]	---	18

[1] - Cooperator agrees not to discourage in any way, field feeding by geese. If significant crop damage occurs, the Refuge will renegotiate this agreement to compensate the cooperator for lost revenue.

VI. ADMINISTRATION & MAINTENANCE

No Refuge force account farming practices will be involved in the 12 Refuge farming units Mowing and weed control are part of the grounds and roads maintenance programs performed by Refuge Staff in non-farmed areas..

A. Current

The following summary includes costs for planning, supervising cooperators, compiling data, and Refuge staff hours of actual work for an average year.

Job Description	Staff Days	$$ Cost
Refuge Manager	2	$ 555
Asst. Manager	3	$ 750
Biologist (2)	14	$ 4,775
Maintenance Workers (3)	12	$ 5,500
Equipment Maintenance and Supplies	--	$ 1,000

All costs for pesticides, lime, and fertilizer will be borne by the cooperative farmer for Fields 1, 2, 7, 8 and 14. Costs for lime, fertilizer, soil-testing and mowing of grasslands, mid-successional fields and songbird plots will be borne by the cooperative farmer and subtracted from his rental costs.

B. Future

1. Adaptive Management & Monitoring - Cooperative farming efforts for field #s3, 6, 9, 10, 11 and 12, need consistent evaluation/monitoring to determine whether management objectives are being met (ie. Is the desired migratory bird use occurring?). If bird use objectives are not being attained, then a better or adjusted use should be sought after and implemented for the farm unit. This is the basis for effective adaptive management practices.

Therefore, an efficient monitoring program should be set up in the near future for each field managed for the migratory bird resource. These surveys should be carried out by an Audubon volunteer and/or a Refuge biologist well-trained in passerine identification for 3-5 consecutive years. Objectives should include: 1) determining use levels of grasslands by passerine species; 2) determining use levels of songbird seed plots by passerines during the spring and fall migrations, as well as the nesting season; 3) determining use levels of Mid-successional fields by various declining passerine species (Field, Grasshopper and Henslow's sparrows, Bobolink, etc.) during the fall and spring migrations and the nesting season.

Should use levels by target species be very low or nonexistent, then a better use for that land should be researched for. Those possibilities should include wetlands restoration, since most local farmland is prior-converted wetlands. These options must also be respectful of local wishes as use of land is a stipulation of sale in most acquisitions.

2. Biodiversity - Effective habitat management for the current, broad range of migratory and resident bird populations that utilize this area throughout the year requires maintenance of existing habitat types. All Refuge farmland has been acquired during the past 10 years. Those lands have been in a farming state for the past 30-40 years. Cooperative farming practices are very efficient and cost-effective methods for maintaining existing, early-successional habitats (often prior-converted wetlands) on newly acquired, Back Bay Refuge lands. These farming practices maintain those lands in their current status until a better understanding of how they fit into the bigger picture is obtained. Developing this "understanding process" requires carrying out surveys and inventories of newly acquired habitats, to realize what species use currently exists there. Once these surveys and inventories are carried out, the needed understandings should be developed that permit managers and biologists to decide whether those species' uses of those habitats is in keeping with other priorities - Refuge and Regional; or whether they should be precluded for a higher priority. Such analyses may also be part of the upcoming Comprehensive Conservation Planning (CCP) process that Back Bay NWR will undergo in the near future; and could contribute to such understandings and better land-use decisions in the future.

Many of these early-successional, newly acquired Refuge habitats (now managed as songbird seed plots, grasslands fields and mid-successional fields) are used by a large number of migratory bird species. Their presence greatly enhances Refuge biodiversity. Without the Cooperative Farming Program, most of the current refuge croplands maintenance effort would not be possible. Those cropland fields would then be lost to advanced successional stages, not yet determined to be the best and wisest use of those lands. Because of the contribution to maintenance of the existing wildlife communities in and around those fields, and the contribution to Refuge biodiversity, the Co-Op farming program meets the current needs of the Refuge's land management effort. Whether this direction changes in the future, with further knowledge and data, has yet to be determined; but may be possible.

3. Long Island - In the past, management of the Long Island fields has proven difficult and expensive. Barge transportation of farming equipment across the shallow Sand Bay stretch has been difficult to effect, because of adverse weather, low bay water levels, and the need to push the barge with a Refuge boat that is not intended for such use. When the costs of farming the Long Island fields to Ladino Clover is weighed against the limited snow goose and very limited Canada goose use observed during the past 7 years, it does not seem to be an efficient farming program. The cooperative farmer agrees.

Therefore, it is recommended that farming not be continued on Long Island in the future. The Long Island fields should be permitted to reforest naturally, during which those fields will serve as nesting habitat for target declining passerine species and waterbirds.

VII. REFERENCES

Back Bay National Wildlife Refuge. 1993. **Station Management Plan.** Virginia Beach, VA.

Hatch, D.R., J.E. Belshan, S.M. Lantz, G.R. Swecker, and D.E. Starner. 1985. **Soil Survey of City of Virginia Beach, Virginia.** Virginia Beach, Virginia.

VIII. APPENDICES

APPENDIX A

1999 - 2000 COOPERATIVE FARMING AGREEMENT

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service

COOPERATIVE FARMING AGREEMENT - ADDENDUM

Cooperator's Name: Mr. Bonney Bright

Address: 5513 Buzzard Neck Road, Virginia Beach, VA 23457

Date of Original(O) & Current(C) Agreement: (O) 05/10/94 (C) January, 1999

Issuing Officer (Original & Current Agreements): (O) Anthony D. Leger (C) John P. Stasko

Pursuant to the provisions of the cooperative farming agreement entered into on the date and by the persons indicated above, for the use of certain lands of the National Wildlife Refuge indicated, the Cooperator and the U.S. Fish and Wildlife Service hereby agree that crops shall be planted and the distribution of the harvest shall be as specified below for the Calendar Year indicated.

Farm Unit	Field #	Crop or Crop Group	Acres	Cooperator's Share (%)	Government's Share	
					Harvested	Unharvested
Tract #150a Sweet Farm Colech. Rd.	1	Corn - 1999 Wheat - '99/2000 Soybeans - 2000	24 24 24	100 100 100	--- --- ---	--- * ---
Tract #163 1820 House Muddy Ck.	2	Corn - 1999 Wheat - '99/2000 Soybeans - 2000	22 22 22	100 100 100	--- --- ---	--- * ---
Tract #201 Muddy Ck.	3	Songbird Mix - '99 Songbird Mix - '00	5 5	--- ---	--- ---	100 100
Tract #125a Refor. Site	6	Grasslands - 1999 Grasslands - 2000	25 25	--- ---	--- ---	100 100
Tract #141 Sandbr. & Colech. Rd.	7	Corn - 1999 Wheat - '99/2000 Soybeans - 2000	10** 10 10	100 100 100	--- --- ---	--- * ---
Tract #166 Currence - Muddy Ck.	8	Corn - 1999 Wheat - '99/2000 Soybeans - 2000	24 24 24	100 100 100	--- --- ---	--- * ---
Tract #104 Hunt Club	9	Grasslands - 1999 Grasslands - 2000	40 40	--- ---	--- ---	100 100

* See Special Condition C.
** Approximately 30 acres of field #7 will be removed from farming during 1999, for wetlands restoration purposes. The cooperative farmer has been informed of this and will continue farming on the remaining 10+ acres during 1999-2000.

COOPERATIVE FARMING AGREEMENT - ADDENDUM (CONTINUED)

Farm Unit	Field	Crop or Crop Group	Acres	Cooperator's Share (%)	Government's Share	
					Harvested	Unharvested
Tract #167 Muddy Ck.	10	Songbird Mix - '99 Songbird Mix - '00	1 1	--- ---	--- ---	100 100
Tract #108 Sandbr. Rd.	11	Mid-Succ.Field-'99 Mid-Succ.Field-'00	10 10	--- ---	--- ---	100 100
Tract #194 Muddy Ck.	12	Mid-Succ.Field-'99 Mid-Succ.Field-'00	38 38	--- ---	--- ---	100 100
Tract #225 NawneyCk.	13	Songbird Mix - '99 Songbird Mix - '00	4 4	--- ---	--- ---	100 100
Tract #205 Henley Field	14	Corn - 1999 Wheat - '99/2000 Soybeans - 2000	18 18 18	100 100 100	--- --- ---	--- --- ---

Cooperator's Signature Date Issuing Officer's Signature & Title Date

SPECIAL CONDITIONS:

A. Soil amendments will be applied only in accordance with the results of a soil analysis performed by Virginia Tech. Samples from each field will be taken in September of each year. Copies of an analysis of each field will be provided to the Refuge Manager or Wildlife Biologist, together with the Annual Report (See Condition F.).

B. No chemical control of weeds, insects, or any other pests will be conducted except as specifically authorized by this permit, or an amendment to it. Only EPA-listed pesticides may be used. Insecticide applications may only occur upon demonstration of an infestation. Consultation with the local agriculture extension agent, and/or a consultant, and prior approval of the Refuge Manager is required. A threshold number of worms present per foot, that can be quantified into a percent crop loss, must be verified by the agriculture extension agent and/or the consultant and be provided to the Refuge Manager as demonstration of an infestation.

Pesticides include:

Year 1 (1999)	Year 2 (2000)
Dual & Atrazine mix (Corn)	Dual (Soybeans)
Roundup (Corn)	Blazer (Soybeans)
Beacon* (Corn)	Poast (Soybeans)
Weedar (Corn & Wheat)	Larvin* (Soybeans)
	Weedar (Wheat)
	Sevin* (Soybeans & Wheat)
	Roundup (Soybeans)

*(Pending U.S. Fish & Wildlife Service Regional Office approval only.)

C. Cooperator agrees not to discourage in any way, field feeding by Canada and snow geese on winter wheat. If significant crop damage occurs, the Refuge will renegotiate this agreement to compensate the cooperator for lost revenue.

D. Plantings in all fields will only occur outside of wetlands boundaries.

E. Rental rates are determined by the average rate in effect in the area. The rental rate in fields #1 and #7 increased during 1997, from $45 to $50 per acre. Changes are shown by **bold type** below. For 1998 and 1999 the rates are as follows:

1998	---	Field #1	$50/acre x 24 acres	=	$1,200
		Field #2	$50/acre x 22 acres	=	$1,100
		Field #7	**$50/acre x 10 acres**	**=**	**$ 500**
		Field #8	$50/acre x 24 acres	=	$1,200
		Field #14	$40/acre x 18 acres	=	$ 720
		TOTAL	**= 98 acres**	**&**	**$ 4,720**
1999	---	Field #1	$50/acre x 24 acres	=	$1,200
		Field #2	$50/acre x 22 acres	=	$1,100
		Field #7	**$50/acre x 10 acres**	**=**	**$ 500**
		Field #8	$50/acre x 24 acres	=	$1,200
		Field #14	$40/acre x 18 acres	=	$ 720
		TOTAL	**= 98 acres**	**&**	**$ 4,720**

The rental rate will be offset by the crops planted and services (ie. mowing, clover fields management, etc.) performed throughout the agreement, as outlined below. The average rental rate is $50 per acre during 1998 and 1999.

F. The permittee must maintain a record of planting dates and rates of application of all fertilizers, pesticides and lime as well as the estimated harvest of each crop, and record this information on the attached form. The completed form must be returned to the Refuge Headquarters Office by January 15, of each year for the preceding year.

G. The cooperator agrees to the following:

1. The cooperator will assume responsibility for managing the grasslands in fields #6 and #9, (Ref. Attached maps and Addendum Cover Table) including having soil tests done by the cooperator's contractor, if necessary, during the spring of each year. Following notification of the Refuge Wildlife Biologist or Manager, of the costs required to carry out the soil test recommendations, the recommended lime and/or fertilizer will be applied at the proper time of year. Grasslands management objectives will revolve around use by declining passerine species (songbirds) and the upland Sandpiper, during migration and the breeding season.

   A detailed record of costs for soil testing and soil treatments will be maintained by the cooperator; copies must be provided to the Refuge contact as soon as possible after the costs are incurred. Grasslands management costs will be subtracted from the rental rates above, for fields #1, #2, #7, #8, and #14, as part of the governments share.

2. An additional portion of the government's crop share in 1999 and 2000 will consist of mowing Fields #6, 9, 11, and 12 at the rate of $25 per acre.

   Mowing will occur once every two or three years in grasslands fields #6 and #9, after the breeding season, and by September 15. No mowing of fields #6 and #9 will be carried out in 1999. A determination will be made in 2000 as to whether those two fields should be mowed then.

   Mowing in mid-successional fields #11 and #12, will occur annually, by section of each field, as shown in the attached maps, and in paragraphs 5 and 6 below.

3. A portion of the government's share will be taken in ten acres of songbird mix in fields #3, #10 and #13 (Ref. attached maps and Addendum Cover Table). The cooperator agrees to prepare these fields (ie. disc, cultipack, etc.) and plant a songbird seed mix during April of 1999 and 2000, (including the cost of seed) at his own expense, with 100% of the crop being taken for birds. The agreed upon rate (as of 03/06/98) for reseeding those fields to songbird mix during 1999 and 2000 is $75 per acre.

4. A large portion of Field #7 and all of Field #7a will be removed from farming during 1999, for conversion to an estimated 25 acres of moist soil management wetlands. A water control structure and ditch plug should flood the lower elevations adjacent to a drainage ditch there. The remainder of Field #7 (approx. 10 acres) will continue to be open to cash crop farming. The attached maps for Field #7 (1999 & 2000) will delineate these changes.

5. A shortage of "mid-successional" (at the early shrub-perennial grass-forb stage) nesting habitats have been identified by Virginia Game & Inland Fisheries nongame biologists as a priority throughout most of Virginia. The shortage of this old-field habitat type is negatively impacting production and use by several declining passerine species in Virginia, including the Field sparrow, Blue Grosbeak, Bobolink and possibly Henslow's sparrow. Therefore, Fields #11 and #12 will continue to be managed as this type of habitat during 1999 and 2000.

Field **#11** will be managed as northern and southern halves, through rotational mowing. The southern half (nearest to Sandbridge Road) will be mowed during September 1999, to remove waxmyrtles and loblolly pine saplings. The northern half will be mowed during September 2000. Reassessment if this policy should be made upon renewal of this Agreement, in the event that reforestation of this field (#11) is deemed more desirable (ie. No use by target declining passerine species).

6. The following strip-mowing rotation is designed to insure that as much of Field **#12** is in a "mid-successional, old-field state" at one time, as possible. Field **#12** will be subdivided into three sections as shown on the attached map. Those sections consist of 1) a northern end block section, and 2) a western, long, rectangular, north-to-south section adjacent to Muddy Creek Road; and 3) an eastern, long, rectangular, north-to-south section adjacent to the treeline, and parallel to the western section.

   The Northern section is overgrown with fennel, other forbs, loblolly saplings, and shrubs. The eastern section is wetter, with short black needlerush, rushes and spike rushes; with a small wet spring running along its' center. Some cattails grow in this wettest area. The western half is drier, and dominated by dead 6'-7' tall fennel, and with very little ground cover below it.

   During 1999, the northern section will be bush-hogged to remove the brush and saplings there. During 2000, the western section will be carefully mowed, avoiding the wetter spots which could bog down the tractor. The northern, eastern, and western sections will be marked off with flourescent flagging. A new cooperative farming agreement will be drafted in 2001.

7. The remainder of the government's share will be determined in 1999 and 2000, after costs of grasslands management and other services described in G.1. above, are deducted. In summary, the division of shares under this agreement are as follows:

   1999

   a) An additional **$4,006.25, of the government share owed by the cooperator from the 1998 Cooperative Farming Program, is hereby carried over as part of this agreement.** It is added into the rental rate for this agreement, in b. below. (Ref. Appendix II, "Summary Cost Analysis from January 1998 to January 1999.")

   b) Fields #1, #2, #8 and #14 to the cooperator in their entirety, plus 10 acres of Field #7. **These fields total 98 acres with a total annual rental rate of $ 4,720. The total rental rate owed by the cooperator at the end of 1999 is:** $4,720 (Section E above) + $4,006.25 (from 7.a) above) = **$ 8,726.25**.

   c) **A share to the government** in the amount of ten acres of songbird mix (See item G.3 above) at a cost of $75 per acre = $750. No lime or fertilizer are to be applied to the 4 acres of Field #13 (Nawney Creek Road) when planting it to a songbird seed mix.

   d) Fields #11 and #12 will continue being managed as "mid-successional fields" during 1999 (Ref. G.4 above). These fields will be permitted to successionally revert to an "old-field" state (prior to the shrub stage), for nesting by declining passerine species. Management will take the form of periodic mowing of sections of those two fields on an alternating basis. The southern half of field #11(5 a.) will be mowed during 1999. The northern section of Field #12 (10 a.) will be mowed during 1999. Therefore, **an additional portion of the government's crop share in 1999 will be deducted as follows:**

Mowing of 10 acres (Field #12) x $25/acre = $250
Mowing of 5 acres (Field #11) x $25/acre = $125
Total = $375

2000

a) Fields #1, #2, #8 and #14 to the cooperator in their entirety, plus a portion of Field #7. **These fields total 98 acres with a total rental rate of $ 4,720. The total rental rate owed by the cooperator at the end of 2000 is:** $8,726.25 (from 7 b. above) + $4,720 (2000 rental rate) = **$13,446.25**.

b) **Ten acres of songbird food plots** as per G.3 above, **for a total share of $750**. No lime or fertilizers are to be applied to the 4 acres of Field #13 (Nawney Creek Road).

c) Mowing of the drier parts of the western section of "mid-successional field" #12 (10 a.) will take place during 2000. Plus mowing the more northern portion of field #11 (5 a.). Therefore, an additional portion of the government's crop share will be deducted as follows:

Mowing of 10 acres (Field #12) x $25/acre = $250
Mowing of 5 acres (Field #11) x $25/acre = $125
TOTAL = $375

d) Possible mowing of Grasslands Fields #6 and #9. To be determined then (2000).

e) **An additional share to the government in the amount of $11,766.25**, determined as follows:

$ 13,446.25 **two year rental cost** - $2,250.00 (two years of shares to the government: $750 (c) mowing mid-succ. fields + $1,500 (b) songbird food plantings) = **$11,196.25 remaining government share.**

from which costs for mowing fields #6 and #9, reseeding and maintenance (as outlined in G.1. above), gravel deliveries, and any liming or fertilizing of refuge dikes, will be deducted. Disposition of any remaining final share to the government will be determined later, or upon the conclusion of this agreement.

H. All farming activities must maintain a minimum distance of three feet from all roads, and ditches and waterways retaining and/or moving water.

I. The cooperator agrees to participate in a new Farm Conservation Plan when it is completed. This Plan will be a joint effort between the cooperator, the Soil Conservation Service and Back Bay National Wildlife Refuge. The plan will entail incorporation of best management practices on lands currently being farmed by the cooperator, with the intent of eliminating unnecessary ditching and drainage, incorporating settling basins and water control structures, improving mowing practices, etc.

APPENDIX B

1998-1999 SUMMARY COST ANALYSIS TABLE

BACK BAY N.W.R. CO-OPERATIVE FARMING PROGRAM

SUMMARY COST ANALYSIS TABLE FROM JANUARY 1998 TO JANUARY 1999

ACTION	FARMER OWES BBNWR	BBNWR OWES FARMER
1. Carryover from bal. due in 1998 from 1996-1997 Agreement.	$5,438.75	-----
2. 1998 Rental of Fields#1,2,7,7a.8,&14 (127acres total)	$6,505.00	-----
3. 1998 Mowing of 2 Clover fields #6 & #9 (65a. - two mowings @ $15/a.)	----	$1,950.00
4. 1998 Soil Tests - Clover Fields #6 & 9	----	$ 520.00
5. 1998 Liming/Fert. of clover fields #6 & 9 ??	----	----
6. Planting 10 acres of Songbird Mix @ $60/acre	----	$ 600.00
7. Discing of Impoundments (C, A & G pools) (45 hrs. X $55/hr.)	----	$2,475.00
8. Deliveries of "Crush & Run" Gravel		
a. Aug. 12, 1998 - 20 tons	----	$ 290.00
b. Oct. 02, 1998 - 40 tons	----	$ 580.00
c. Oct. 16, 1998 - 20 tons	----	$ 290.00
d. Oct. 27, 1998 - 40 tons**	----	$ **580.00****
e. Jan. 15, 1999 - 30 tons	----	$ 435.00
f. Jan. 15, 1999 - 15 tons	----	$ 217.50
TOTALS	$11,943.75	$ 7,937.50

**No receipt received for this delivery of "crush & run" gravel; but recorded in my records. JBG

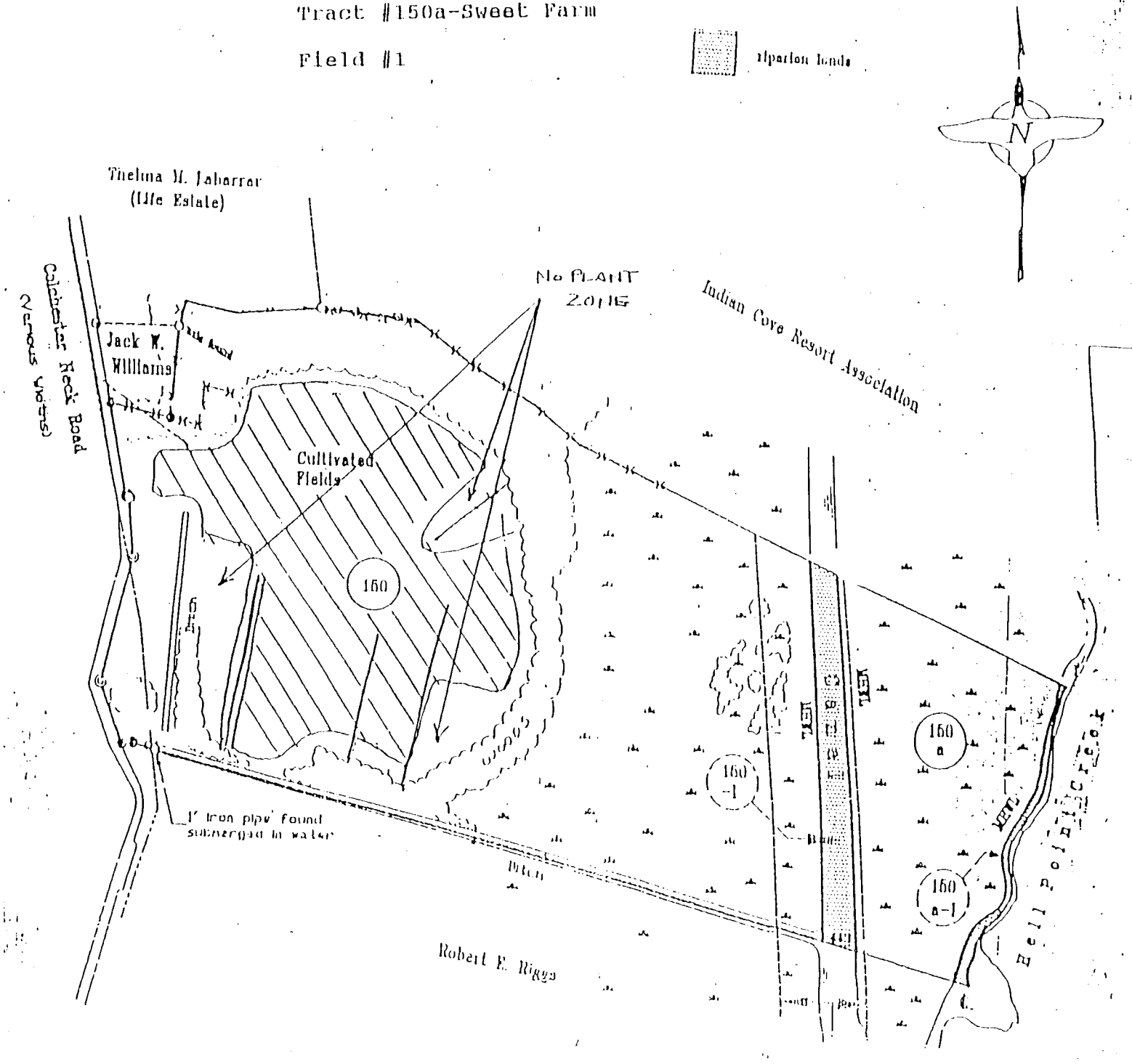
FARMER OWES BBNWR: $11,943.75
BBNWR OWES FARMER: - $ 7,937.50
BALANCE: $ 4,006.25 Owed by farmer to BBNWR as of Feb.16, 1999.

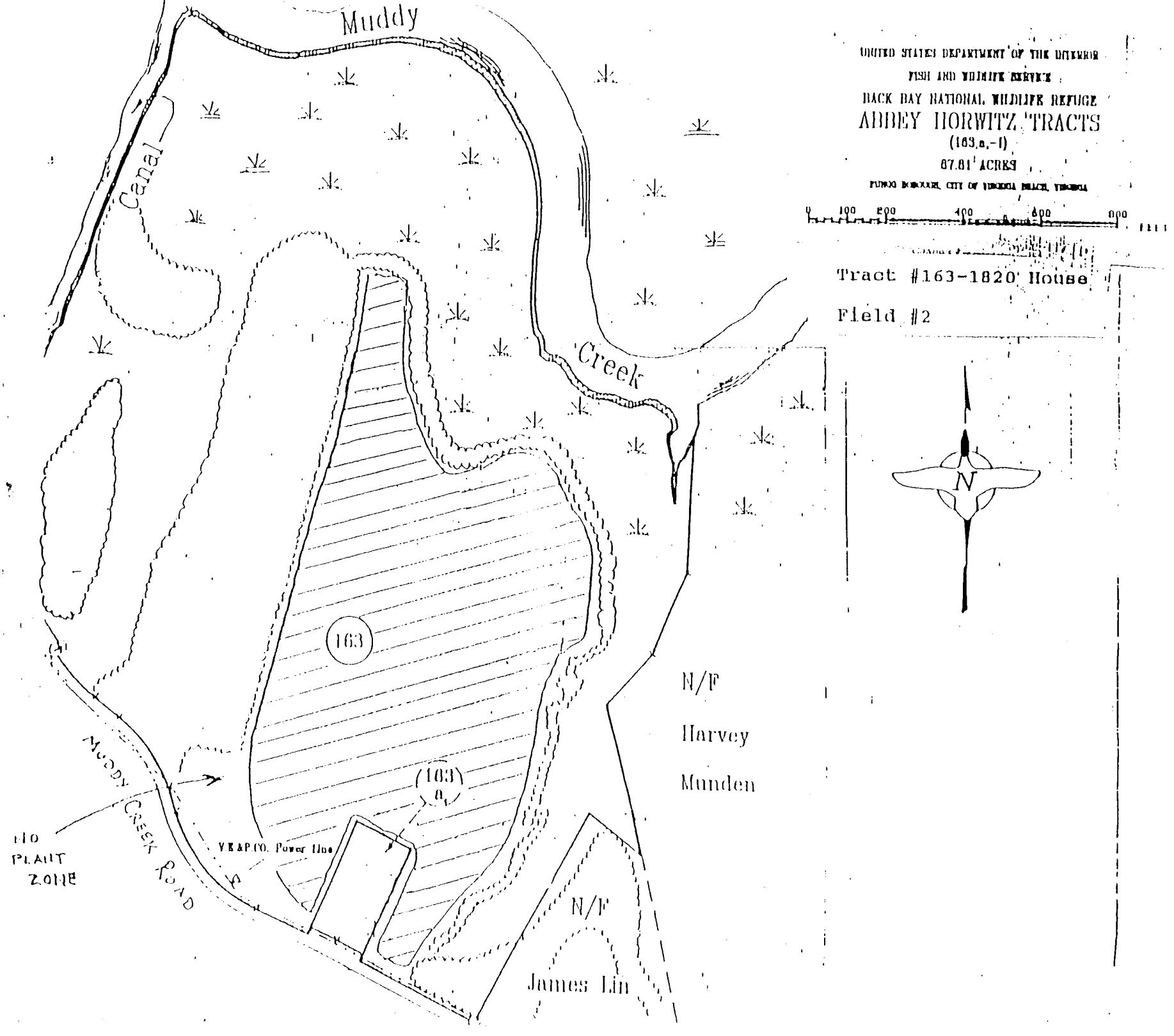
APPENDIX C

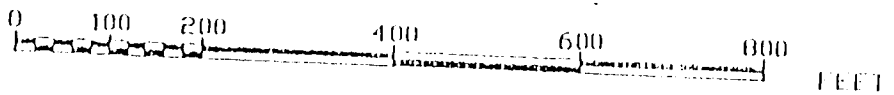
MAPS OF FARM UNITS FIELDS

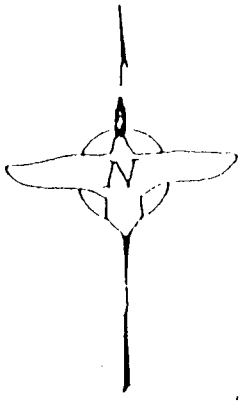
Tract #150a-Sweet Farm

Field #1



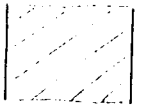

Muddy
Canal
Creek
163
(163)
a
N/F
Harvey
Munden
N/F
James Lin
MUDDY CREEK ROAD
TO
PLANT
ZONE
V E & P CO. Power Line
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BACK BAY NATIONAL WILDLIFE REFUGE
ABBEY HORWITZ TRACTS
(163.a.-1)
67.81 ACRES
0 100 200 400 600 800 FEET
Tract #163-1820' House
Field #2
N



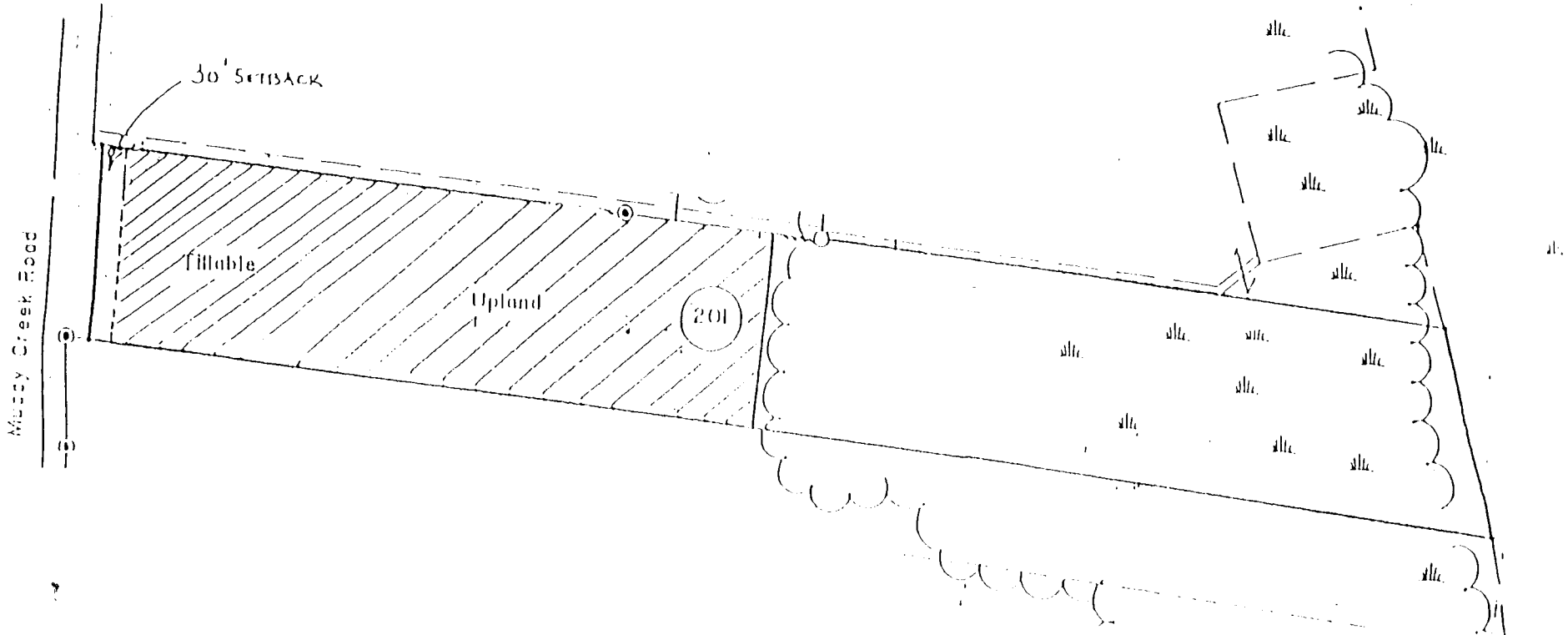


Tract #201-Muddy Creek

Field #3



Fields



BACK BAY NATIONAL WILDLIFE REFUGE

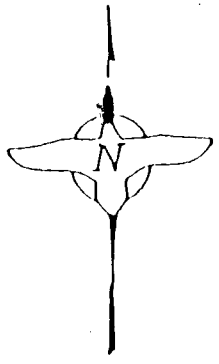
SANDBRIDGE ROAD ENTERPRISES TRACT

(125a)

100.99 ACRES

Borough of Princess Anne, City of Virginia Beach, Virginia

0 200 400 800 1200 1600 FEET



Field #6

UNITED STATES
(TRACT 127)

H/F
Jesse W.
Bolenga

H/F
Luther
Bolenga

Dirt Farm Road

Cultivated Field

Remains of old Buildings

Cultivated Field

Cultivated Field

Hell Point Creek Road

Sandbridge

UNITED STATES
(TRACT 127b)

H/F
Indian
Cove
Campground

Pond

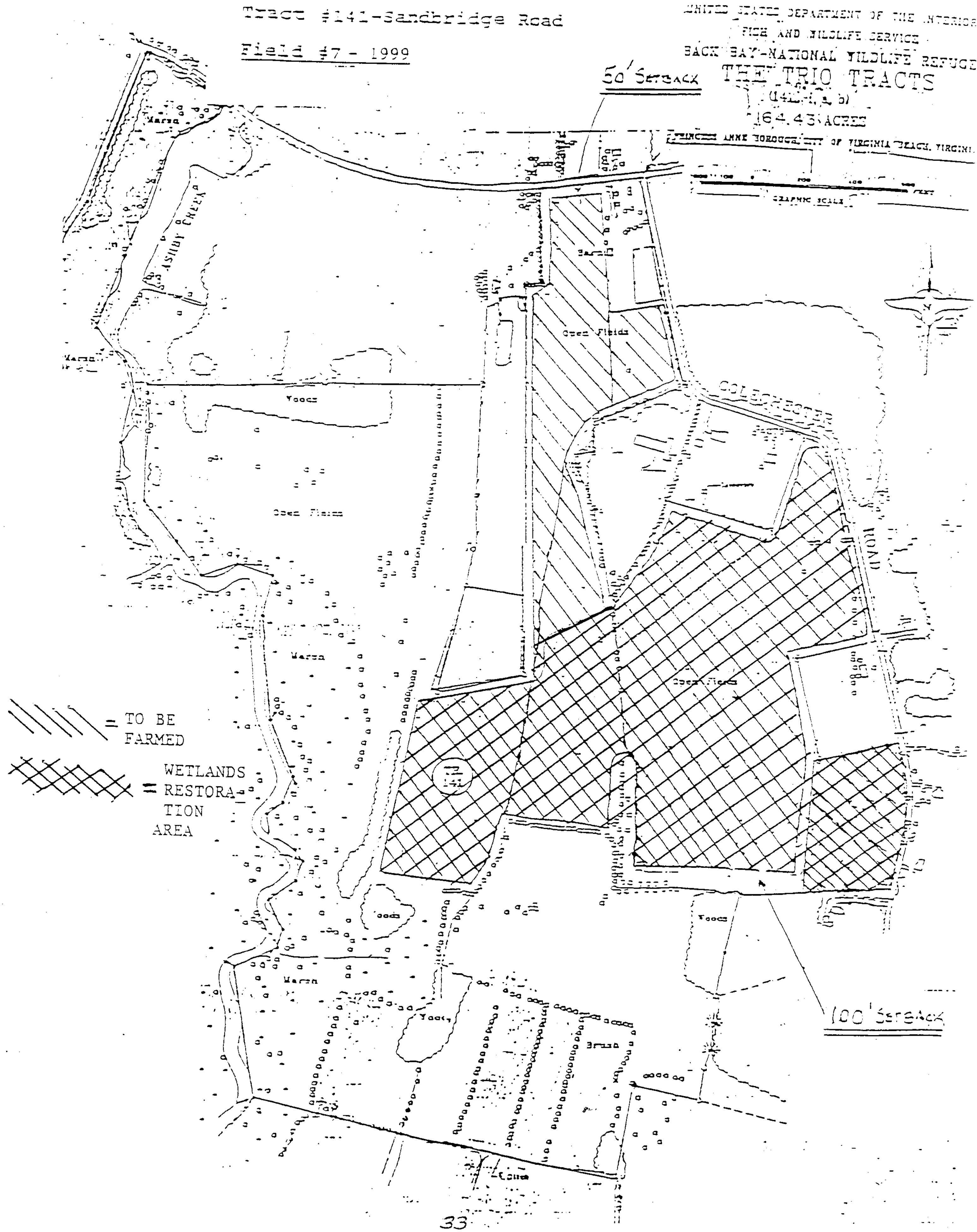
Hell Point Creek

H/F
Indian
Cove

UNITED STATES
(TRACT 104b)

UNITED STATES
(TRACT 104-1)

UNITED STATES
(TRACT 126-1)


Tract #141-Sandbridge Road
Field #7 - 1999
UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BACK BAY-NATIONAL WILDLIFE REFUGE
THE TRIO TRACTS
164.43 ACRES
PRINCESS ANNE BOROUGH, CITY OF VIRGINIA BEACH, VIRGINIA
GRAPHIC SCALE
50' Setback
100' Setback
ASHBY CREEK
COLCHESTER
ROAD
Marsh
Woods
Open Fields
Brush
141
= TO BE FARMED
= WETLANDS RESTORATION AREA

UNITED STATES DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

BACK BAY NATIONAL WILDLIFE REFUGE

CARL GREY CURRENCE TRACTS

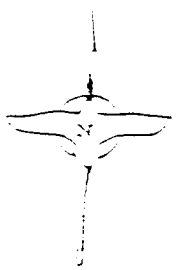
(166, -D)

44.23 ACRES

PUNGO BOROUGH, CITY OF VIRGINIA BEACH, VIRGINIA

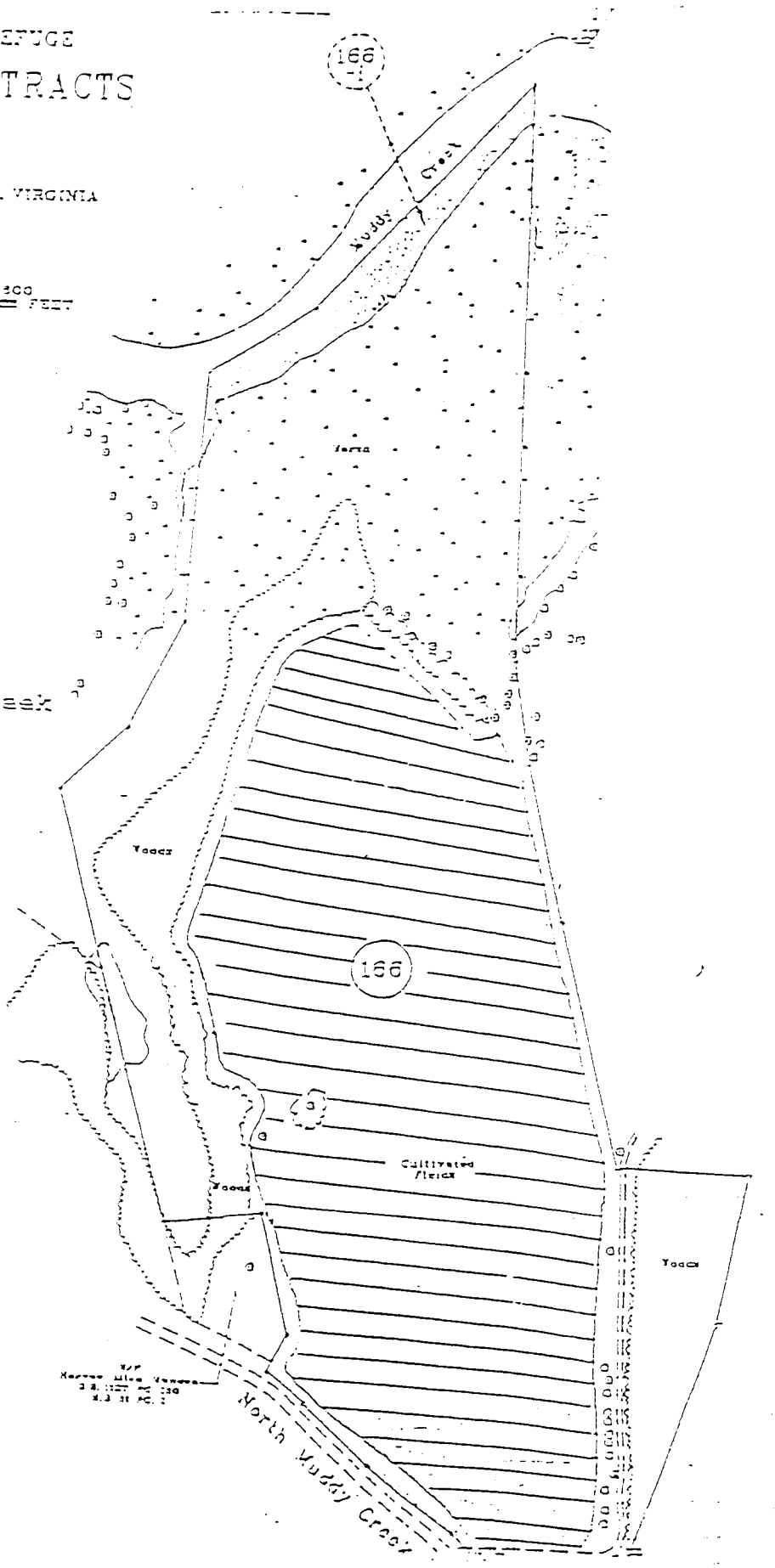
200 100 0 200 400 600 FEET

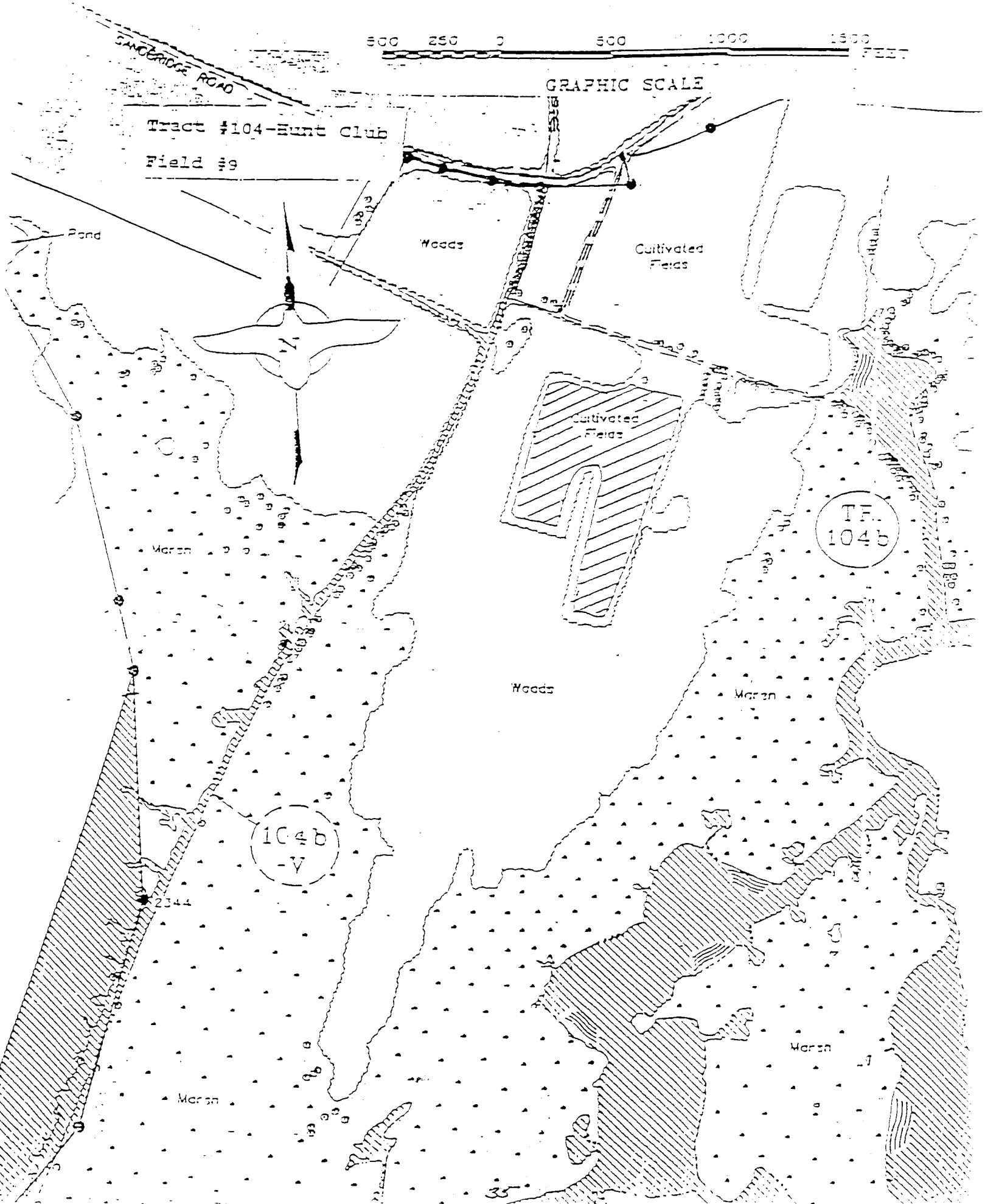
GRAPHIC SCALE



Tract #166—Currence/Muddy Creek

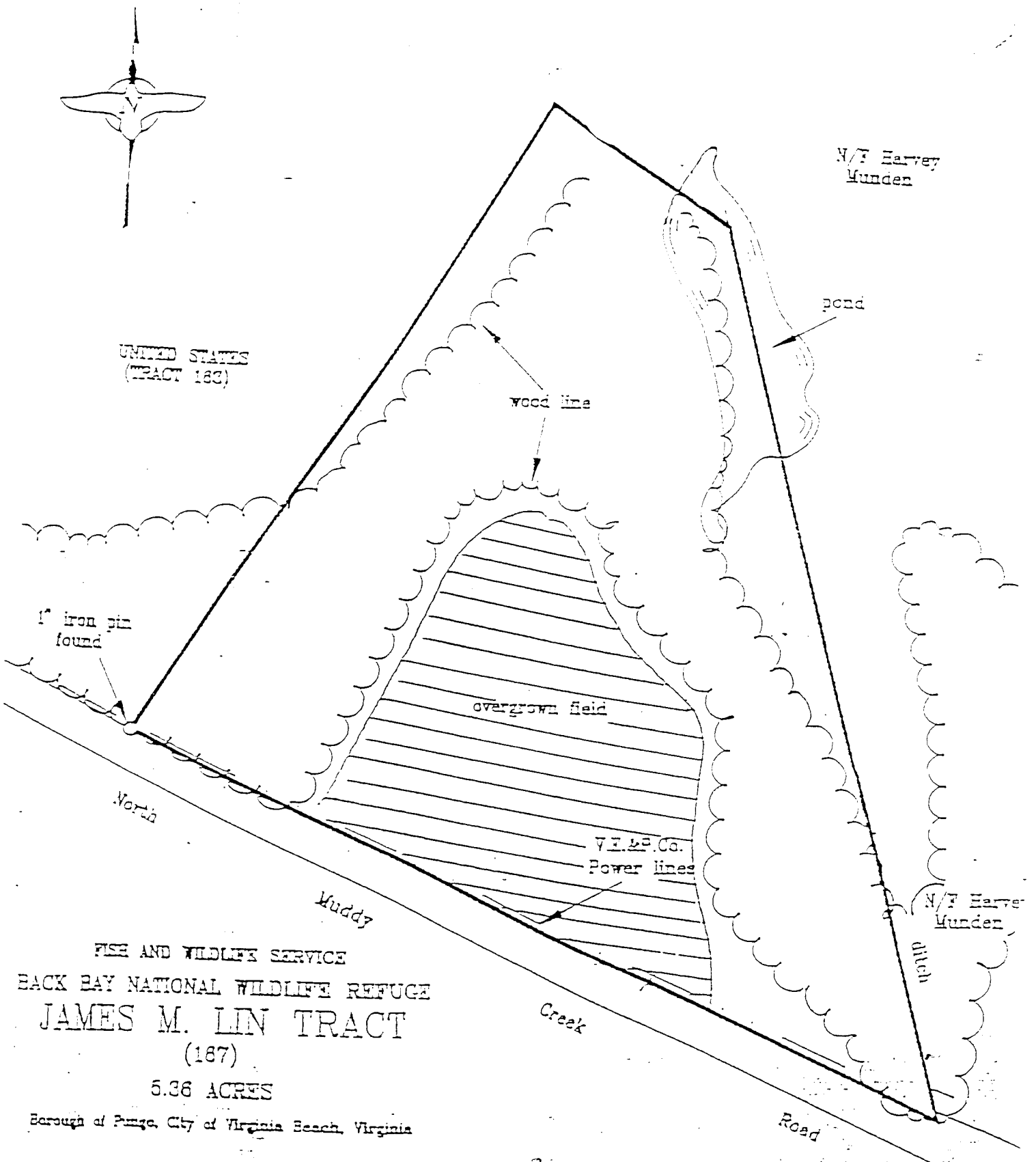
Field #2




500 250 0 500 1000 1500 FEET
GRAPHIC SCALE
SANDRIDGE ROAD
Tract #104-Hunt Club
Field #9
Pond
Woods
Cultivated Fields
Cultivated Fields
Marsh
Woods
Marsh
Marsh
Marsh
TR 104
104 -V
2344
35

Tract #167-Muddy Creek

Field #10



FISH AND WILDLIFE SERVICE

BACK BAY NATIONAL WILDLIFE REFUGE

JAMES M. LIN TRACT

(167)

5.36 ACRES

Borough of Pungo, City of Virginia Beach, Virginia

Tract #108-Sandbridge Road

Field #11 - 1999-2000 MANAGEMENT

FISH AND WILDLIFE SERVICE

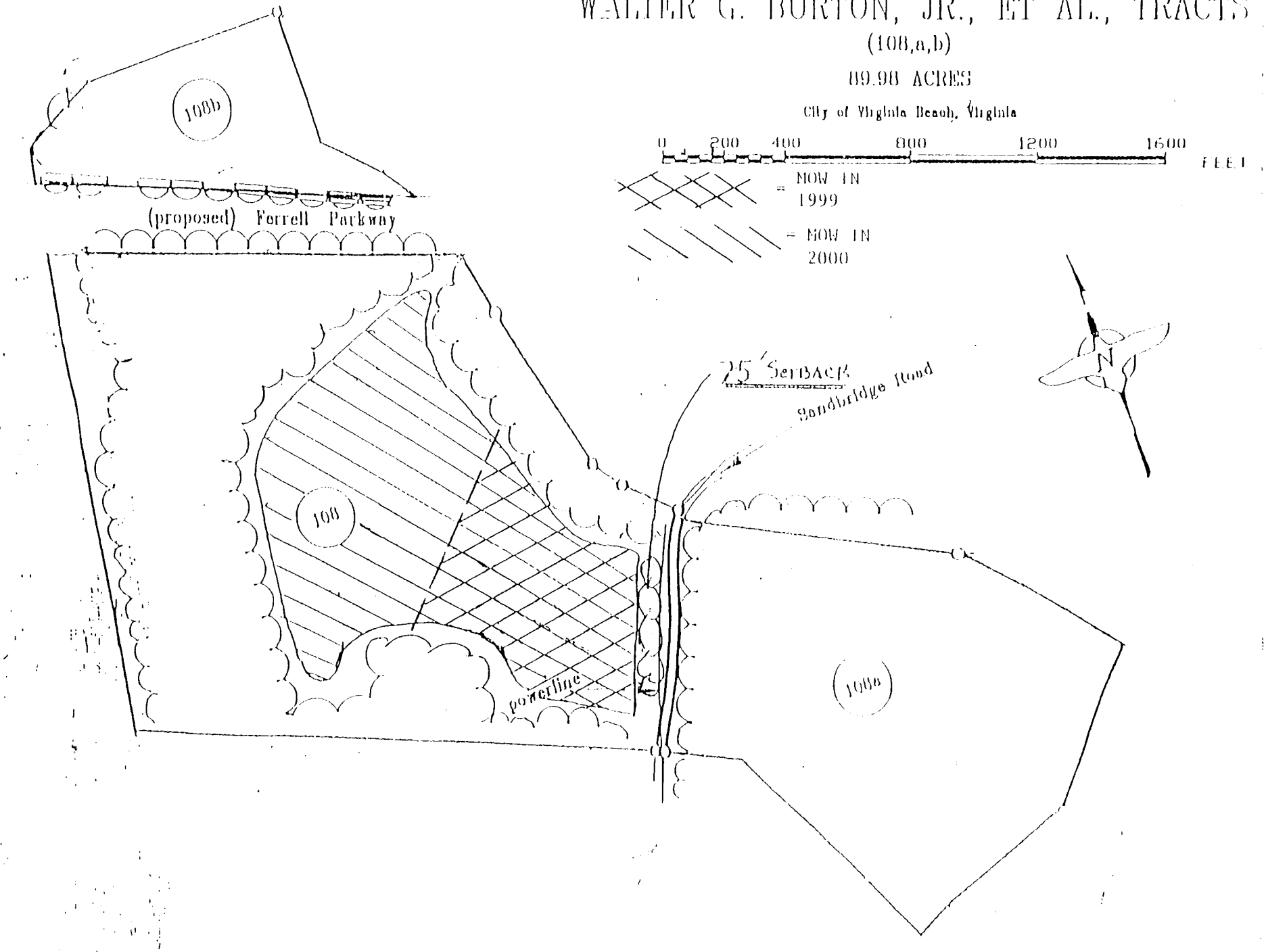
BACK BAY NATIONAL WILDLIFE REFUGE

WALTER G. BURTON, JR., ET AL., TRACTS

(108,a,b)

89.98 ACRES

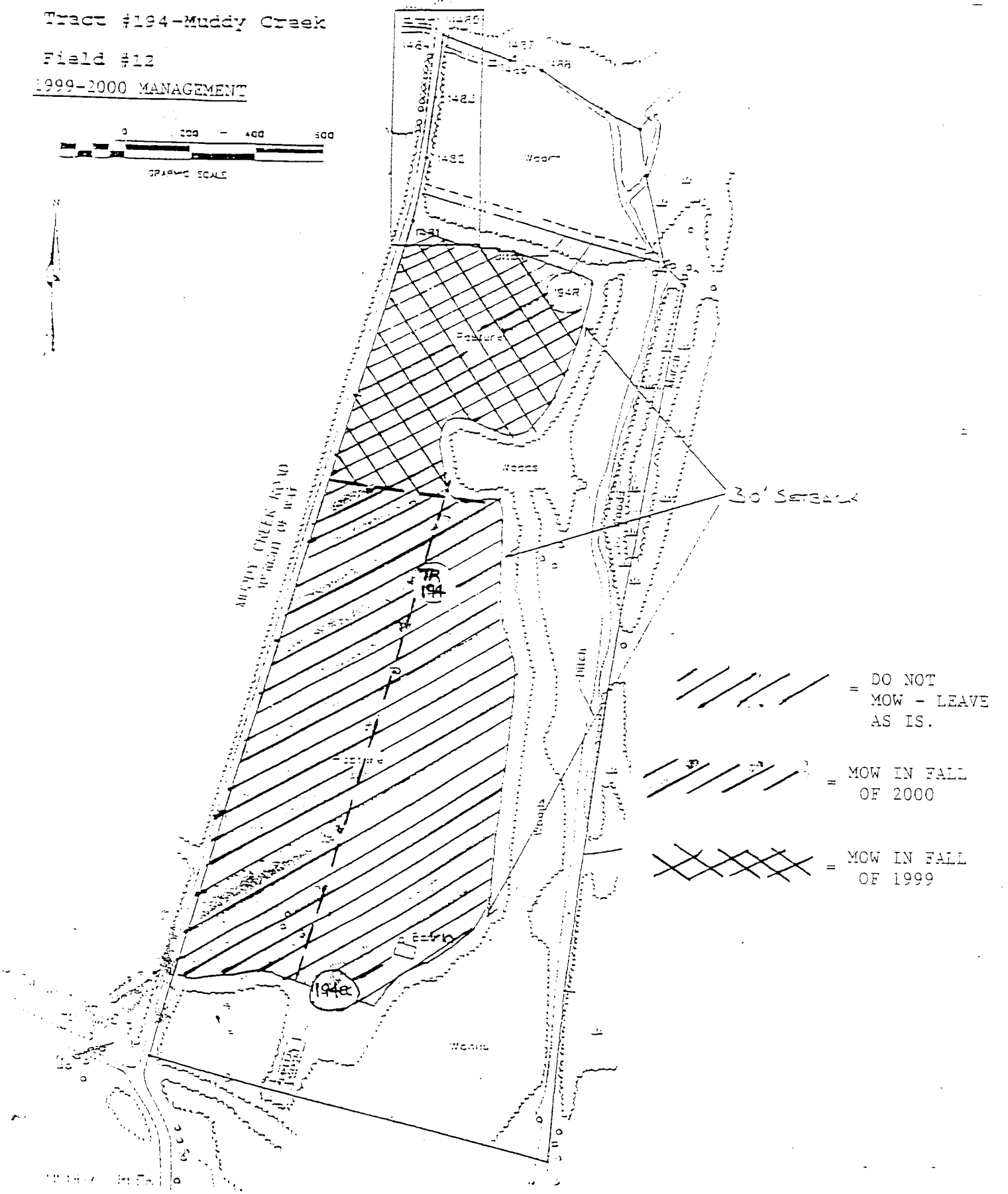
City of Virginia Beach, Virginia



Tract #194-Muddy Creek

Field #12

1999-2000 MANAGEMENT



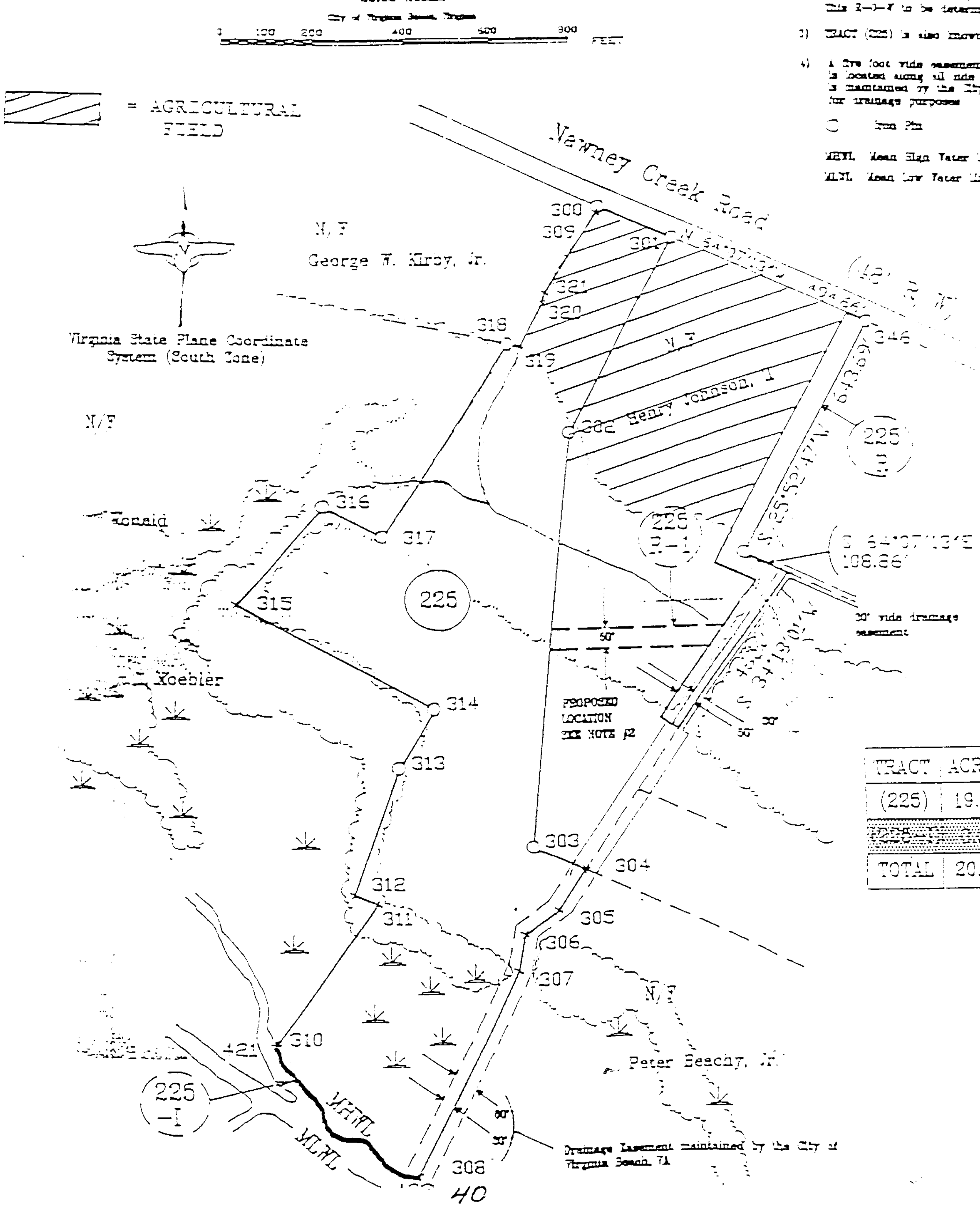
= DO NOT MOW - LEAVE AS IS.

= MOW IN FALL OF 2000

= MOW IN FALL OF 1999

FIELD #12 - NAWNEY CREEK FIELD (4.5 ACRES)

BACK BAY NATIONAL WILDLIFE REFUGE
MICHAEL D. BAGLE TRACTS
(225,-1R-1)
20.03 ACRES
City of Virginia Beach, Virginia



1) ... thru land N/F of Henry Johnson ... GPIN #2410-75-1256, #2410-44- ... #2410-74-0112 and #2410-36-...

2) TRACT (225R-1) is a right-of-way ... thru land N/F of Henry Johnson ... This R-O-W to be determined ...

3) TRACT (225) is also known as ...

4) A five foot wide easement ... is located along all side and ... is maintained by the City of ... for drainage purposes

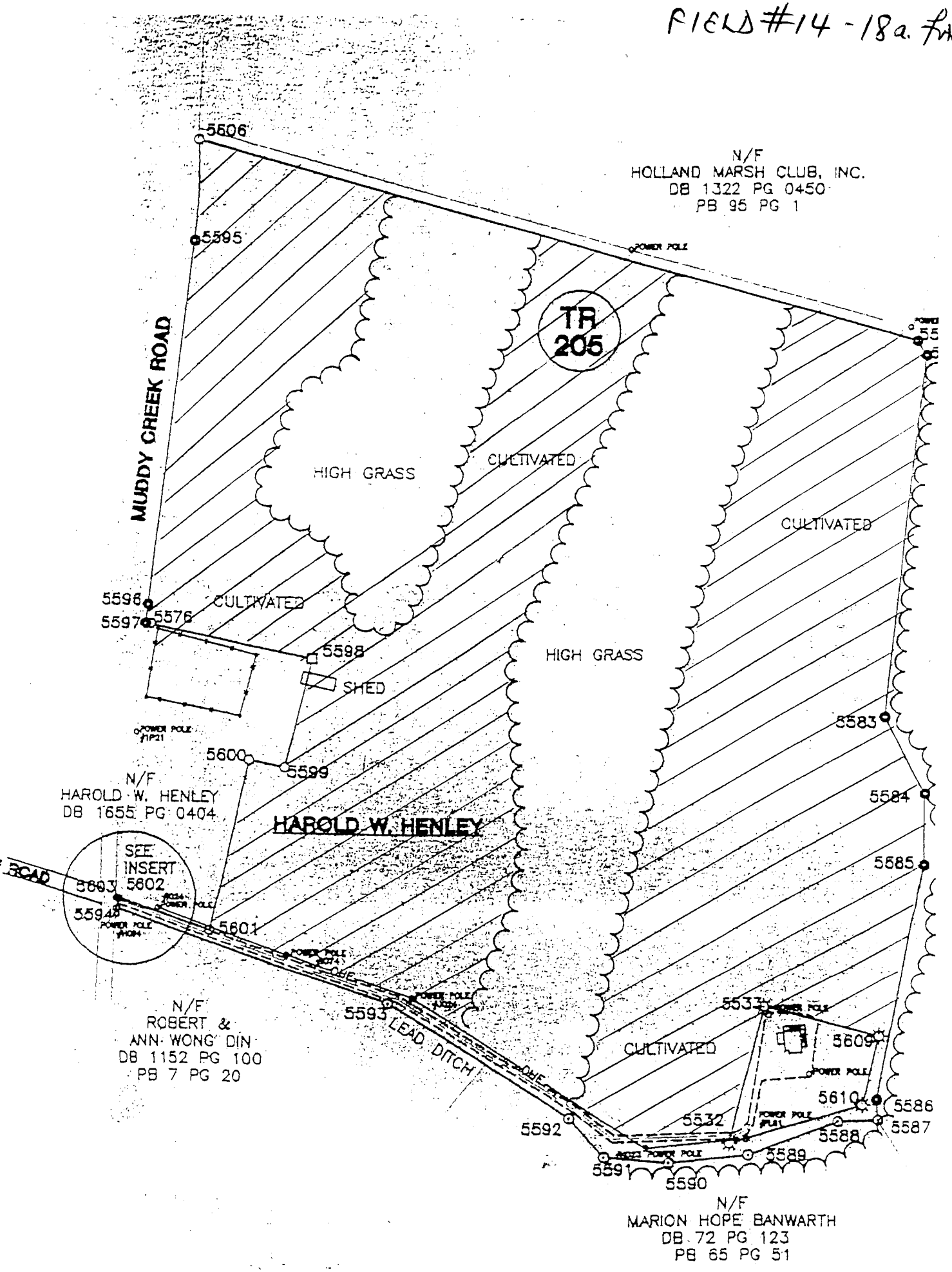
○ Iron Pin

MHWL Mean High Water Line

MLWL Mean Low Water Line

TRACT	ACRES
(225)	19.34
(225-R-1)	0.69
TOTAL	20.03

FIELD #14 - 18a. Farmed



APPENDIX D

ANNUAL SUMMARY REPORT OF LIME, FERTILIZER, PESTICIDE, AND PLANTING DATES BY CO-OP FARMER

Annual Summary Report of Lime, Fertilizer, Pesticide, and Planting Dates by Co-op Farmer

Date: 1998 Co-op Farmer: Bonney G. Bright

Field	Crop	Fertilizer Formulation	Date Applied	Amount Applied	Lime Applied	Date Applied	Herbicide or Insecticide Applied	Date Applied	Rate of Application	Date Planted	Estimated Harvest
1	soy beans	60% K, no N or P		60 lbs.	0.5 ton/acre (7 acres)		Blazer Brasagram Duel	June 20 May 20 May 20	0.75 pt/acre 0.75 pt/acre 1.0 pt/acre		
2	soy beans	60% K, no N or P		60 lbs.	0.5 ton/acre (5 acres)		Blazer Brasagram Duel	June 20 May 20 May 20	0.75 pt/acre 0.75 pt/acre 1.0 pt/acre		
7a	soy beans	60% K, no N or P		60 lbs.	0.5 ton/acre (6 acres)		Blazer Brasagram Duel	June 20 May 20 May 20	0.75 pt/acre 0.75 pt/acre 1.0 pt/acre		
7	soy beans	60% K, no N or P		60 lbs.	1.0 ton/acre (remainder)		Blazer Brasagram Duel	June 20 May 20 May 20	0.75 pt/acre 0.75 pt/acre 1.0 pt/acre		
8	soy beans	60% K, no N or P		60 lbs.	0.5 ton/acre (½ field)		Blazer Brasagram Duel	June 20 May 20 May 20	0.75 pt/acre 0.75 pt/acre 1.0 pt/acre		
14	soy beans	60% K, no N or P		60 lbs.	None		Blazer Brasagram Duel	June 20 May 20 May 20	0.75 pt/acre 0.75 pt/acre 1.0 pt/acre		

APPENDIX E

1998 SOIL SAMPLE TESTING RESULTS

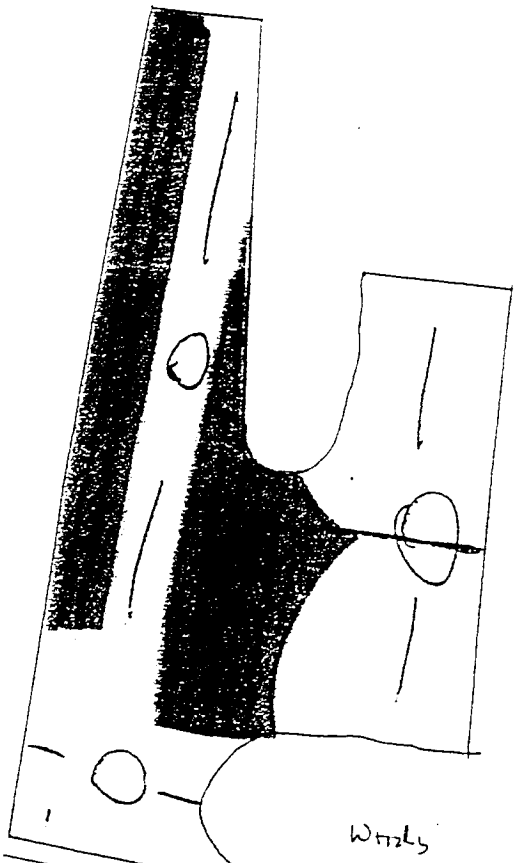
EWATER AGRONOMICS, INC.
. BOX 310
DEN N. C. 27921

Bonney Bright
5513 Buzzard Neck Road
Virginia Beach, VA 23457

Old Hunt Club 30+ Ac.

Lime Map
2/1/99

NCDA Woods Results



Lime Rates

-0- No Lime

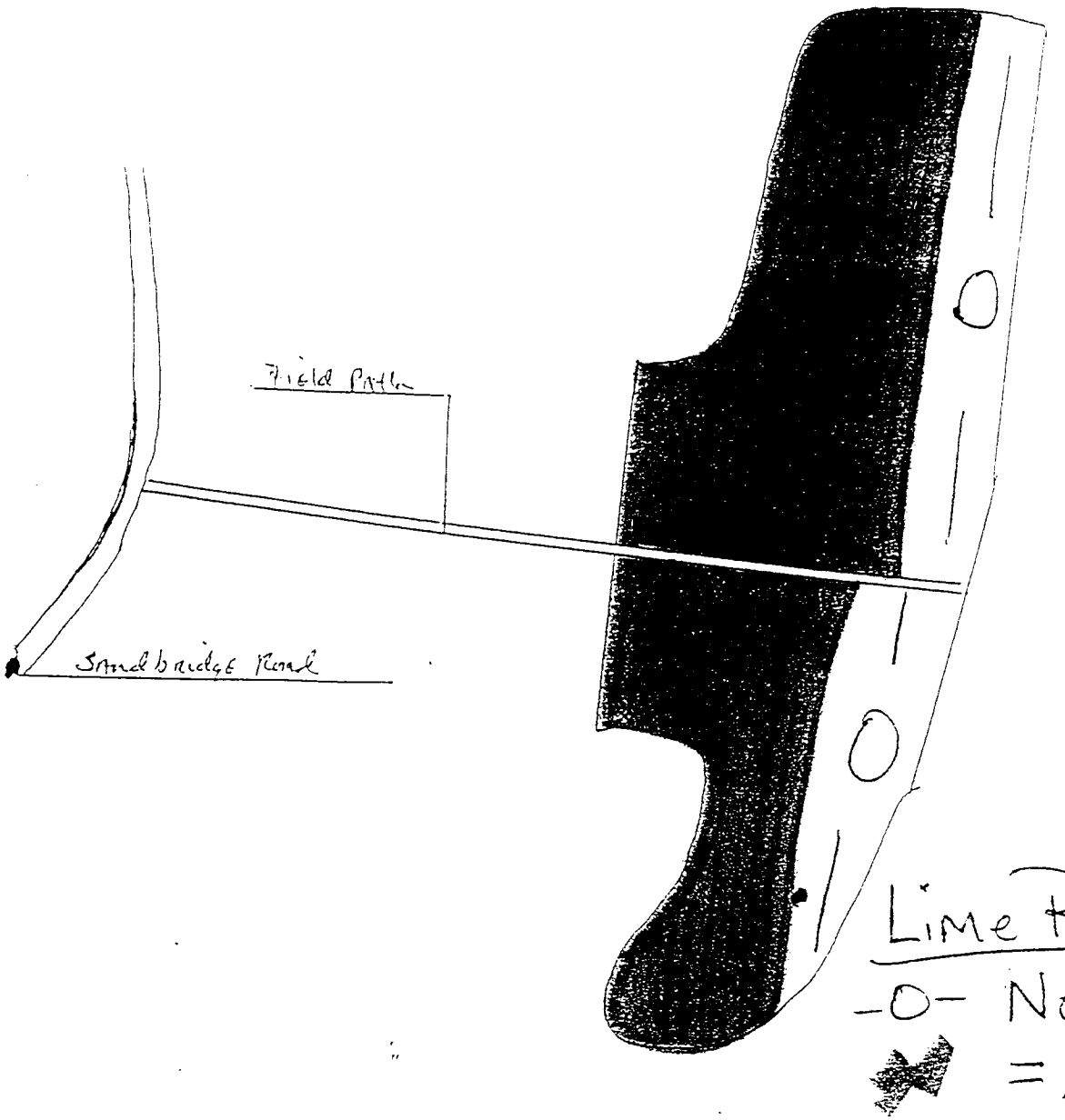
= .5 T/A.

DEWATER AGRONOMICS, INC.
O. BOX 310
AMDEN, N. C. 27921

Brandy Smith
5513 Buzzard Neck Road
Virginia Beach, VA 23457

Fish Shack Farm Sec. VA

Lime Map
2/1/99
NCDA Results



Lime Rates

-0- No Lime

✱ = .5 T/A

APPENDIX E

1998 SOIL SAMPLE TESTING RESULTS

Agronomic Division 4300 Reedy Creek Road Raleigh, NC 27607-6465 (919) 733-2655

Report No. 20577

Soil Test Report

Grower: Bright, Bonney
5513 Buzzard Neck Rd.
Virginia Beach, VA 23457

Copies to: Tidewater Agronomics Inc

June 3/11/99

Farm: Old Hunt Club

Tidewater Agronomics Inc.
PO Box 310
Camden, NC 27921

1/29/99 SERVING N.C. CITIZENS FOR OVER 50 YEARS

Currituck County

Agronomist Comments:

Field Information		Applied Lime			Recommendations									
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	See Note
1A		3	1998	0.5	1st Crop: Corn Grain	0	120-160	0	10-30	0	0	0		0	3
					2nd Crop:										

Test Results																				
Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.6	1.13	8.4	93.0	0.6	5.3	89	62	73.0	15.0	55	61		434	434	244	51				0.1

Field Information		Applied Lime			Recommendations									
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	See Note
1B		3	1998	0.5	1st Crop: Corn Grain	0	120-160	20-40	50-70	0	0	0		0	3
					2nd Crop:										

Test Results																				
Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	1.08	1.06	5.4	72.0	1.5	6.3	45	41	54.0	14.0	22	26		63	63	57	86				0.2

Field Information		Applied Lime			Recommendations									
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	See Note
1R		3	1998	0.5	1st Crop: Corn Grain	≤ .3T	120-160	20-40	50-70	0	0	6		10	3
					2nd Crop:										

Test Results																				
Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	1.25	1.08	4.3	72.0	1.2	5.7	46	38	54.0	14.0	14	25		21	21	37	83				0.2

Field Information		Applied Lime			Recommendations									
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	See Note
1L		3	1998	1.0	1st Crop: Corn Grain	≤ .3T	120-160	20-40	90-110	0	0	0		0	3
					2nd Crop:										

Test Results																				
Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.86	1.07	4.4	64.0	1.6	5.7	45	21	46.0	15.0	15	26		27	27	34	68				0.1

Information		Applied Lime			Recommendations										
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P_2O_5	K_2O	Mg	Cu	Zn	B	Mn	See Note
1M		3	1998	1.0	1st Crop: Corn Grain	0	120-160	0	30-50	0	0	0		0	3
					2nd Crop:										

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO_3-N	NH_4-N	Na
MIN	0.71	1.19	4.8	88.0	0.6	5.9	85	48	67.0	17.0	36	40		102	102	68	68				0.2

84

NCDA Agronomic Division 4300 Reedy Creek Road Raleigh, NC 27607-6465 (919) 733-2655

Report No: 20886

Soil Test Report

Grower: Bright, Bonney
5513 Buzzard Neck Rd.
Virginia Beach, VA 23457

Copies to: Tidewater Agronomics Inc.

Farm: Fish Shack

Currituck County

Tidewater Agronomics Inc.
PO Box 310
Camden, NC 27921

1/29/99

SERVING N.C. CITIZENS FOR OVER 50 YEARS

Agronomist Comments:

Field Information		Applied Lime			Recommendations									
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
1R	Milo (Grain Sorg)	3	1998	1.5	1st Crop: Corn Grain	0	120-160	0	40-60	0	0	6		0	3
					2nd Crop:										

Test Results																				
Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	1.08	1.15	4.5	67.0	1.5	5.7	112	42	48.0	15.0	39	45		18	18	40	77				0.1

Field Information		Applied Lime			Recommendations									
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
1LA	Milo (Grain Sorg)	3	1998	1.5	1st Crop: Corn Grain	.5T	120-160	30-50	70-90	0	0	6		0	3
					2nd Crop:										

Test Results																				
Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	1.37	1.06	3.9	62.0	1.5	5.4	43	31	43.0	16.0	21	30		13	13	27	93				0.2

Field Information		Applied Lime			Recommendations									
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
1LB	Milo (Grain Sorg)	3	1998	1.5	1st Crop: Corn Grain	.5T	120-160	40-60	70-90	0	2	6		0	3
					2nd Crop:										

Test Results																				
Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	1.14	1.06	3.9	62.0	1.5	5.4	37	31	43.0	14.0	31	36		12	12	25	85				0.2

Field Information		Applied Lime			Recommendations									
Sample No.	Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
1M	Milo (Grain Sorg)	3	1998	1.5	1st Crop: Corn Grain	.5T	120-160	0	70-90	0	0	6		0	3
					2nd Crop:										

Test Results																				
Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.86	1.14	3.7	59.0	1.5	5.3	117	29	43.0	13.0	42	42		20	20	41	79				0.1

...mation	Applied Lime			Recommendations										
...ple No. Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
2R Milo (Grain Sorg)	3	1998	1.5	1st Crop: Corn Grain	5 .4T	120-160	0	70-90	0	0	0		0	3
				2nd Crop:										

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	1.14	1.04	4.9	71.0	1.4	5.4	69	29	46.0	23.0	34	37		28	28	43	137				0.7

Field Information	Applied Lime			Recommendations										
Sample No. Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
2LA Milo (Grain Sorg)	3	1998	1.5	1st Crop: Corn Grain	0	120-160	0	50-70	0	0	0		0	3
				2nd Crop:										

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.81	1.13	5.6	63.0	2.1	5.8	151	38	45.0	13.0	54	52		154	154	104	79				0.2

Field Information	Applied Lime			Recommendations										
Sample No. Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
2LB Milo (Grain Sorg)	3	1998	1.5	1st Crop: Corn Grain	0	120-160	0	40-60	0	0	0		0	3
				2nd Crop:										

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.71	1.15	4.4	73.0	1.2	5.6	76	43	50.0	17.0	60	59		48	48	41	72				0.2

Field Information	Applied Lime			Recommendations										
Sample No. Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
2MA Milo (Grain Sorg)	3	1998	2.0	1st Crop: Corn Grain	5 .3T	120-160	0	30-50	0	0	0		0	3
				2nd Crop:										

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.86	1.03	5.0	64.0	1.8	5.6	115	48	47.0	13.0	55	50		217	217	96	70				0.1

Field Information	Applied Lime			Recommendations										
Sample No. Last Crop	Mo	Yr	T/A	Crop or Year	Lime	N	P2O5	K2O	Mg	Cu	Zn	B	Mn	See Note
2MB Milo (Grain Sorg)	3	1998	2.0	1st Crop: Corn Grain	5 .3T	120-160	0-20	40-60	0	0	0		0	3
				2nd Crop:										

Test Results

Soil Class	HM%	W/V	CEC	BS%	Ac	pH	P-I	K-I	Ca%	Mg%	Mn-I	Mn-AI (1)	Mn-AI (2)	Zn-I	Zn-AI	Cu-I	S-I	SS-I	NO3-N	NH4-N	Na
MIN	0.97	1.21	4.3	67.0	1.4	5.4	56	46	48.0	13.0	73	61		36	36	37	81				0.2

REVISED MAY 1999

REFUGES AND WILDLIFE INTERNAL ROUTING SLIP

****

For Your Info	____	Sign	____	Log Number	____
Action	_X_	Surname	____	Due Date	____
Review/Comment	____	Route	____	Finalize	____
				Processing	____

****

REGIONAL DIRECTORATE
___ **LAMBERTSON - RD**
___ **VACANT - DRD**
_____ HOGAN

PROGRAMATIC ARDs
___ **LEGER - RW**
_____ MARTIN
___ **O'HARA - LE**
_____ TANEY
___ **PISAPIA - ES**
___ **GEIGER - FR**
_____ GUIMOND

GEOGRAPHIC ARDs
___ **MORGAN - GARD-N**
___ **DYER - RW**
___ **HOWEY - FR**
___ **DOWHAN - ES**
___ **BENNETT - GARD-S**
_/_ **STEWART - RW**
___ **PANEK - FR**
___ **UNDERWOOD - ES**
_____ GALLANT

****

DIVISION OF REFUGES
___ **McMAHON (Acting)**

PROGRAM SUPPORT
___ **BEALL**
_____BAILLARGEON
_____NARDONE
_____PACHECO
___ D. GREELEY
___ K. QUIST
___ T. STEBLEIN (CPM)

INFORMATION MANAGEMENT & BUDGET DEVELOPMENT
___ **VACANT-Management Analyst**
___ KIMMEL
___ MARTINEZ
___ MAZZARO
___ MOMOT
___ NEYHART

REFUGE SUPPORT
___ **GOETTEL**
___ VACANT

WILDLIFE RESOURCE
___ **HESTBECK-Reg. Biologist**
___ A. CARTER (Fire - DIS)
___ H. LASKOWSKI (ZB-S, PMH)
___ J. TAYLOR (ZB-N, GRB)
___ J. CASEY (AZB-N, LKU)

MIGRATORY BIRD MANAGEMENT
___ HAAS-Game Coordinator
___ **PENCE-Nongame Coord./PERMITS**
___ DETTMERS
___ DOBIAS ___ NADEAU
___ FLEMING ___ RATCLIFFE

NAWMP COORDINATOR
___ **J. McCAULEY**
___ HAYES (NGR)
___ WATSON (USFS)

OUTREACH COORDINATOR
___ **VACANT**

PLANNING & VISITOR SERVICES
___ **OLSON - Branch Manager**
___ BEVILACQUA
___ BONETTI ___ LATINO
___ HIGHT ___ McGARIGAL
___ JACOBSON ___ PALAIA
_____ JENNINGS ___ ROONEY
___ KREY ___ WILSON

****

DIVISION OF REALTY
___ **FRENCH - Realty Officer**

PROGRAM SUPPORT
___ DUCEY
___ C. GREELEY
___ H. ROBINSON
_____ MEDINA
_____ D. ROBINSON
_____ VARTANIAN

REVIEW APPRAISERS
___ FELTY
___ RYBOLT

RE MANAGEMENT & APPRAISALS
___ **OLIVEIRA - Branch Manager**

REALTY MANAGEMENT
___ **JAROUS - Team Leader**
___ ABARE
___ BENTLEY ___ LEAHY
___ HUTTON ___ WALDRON
___ LARSON ___ WHARTON

APPRAISERS
___ **CHIAPPONI - Team Leader**
___ BRYANT
___ McLAUGHLIN (EBF)
___ RUSSO

LAPS & SURVEYS
___ **CONNER - Branch Manager**

LAND ACQUISITION PLANNING
___ **QUIST - Team Leader**
___ CHASE
___ MELBERG
___ PAU
___VARTERESIAN
___ WHITLOCK
___ ZINNI

SURVEYS
___ **NELMES - Team Leader**
___ BEACH
___ CANNING ___ HAYDEN
___ COLEMAN ___ HILLIS
___ GESER ___ WEIGAND

CARTOGRAPHY & SPATIAL DATA SERVICES
___ **SHAFFER - Branch Manager**
___ EATON
___ FULLER ___ ROBERTS
___ KENNEY ___ SCHAUFFLER
___ PLAUSKY ___ THOMPSON

REPLY REQUESTED BY: _____ **FILE DESIGNATION:** _____

COMMENTS: Tom, Attached 3 cropland Plans from Back Bay.

Hal

September 21, 1999

Tom,

Attached is Cropland Mgmt Plan from Back Bay. This is the second time they have submitted it for approval.

I basically agree with the plan. The refuge has actually expanded the plan to cover some habitats other than croplands. Thus, technically it is not just a cropland mgmt plan. However, this is a good way to go, since they are thinking about all their early successional field and cropland habitats at one time. I agree with their line of thinking for some of the grassland and early successional species.

In the near future, the Service will be coming out with the final version of Habitat Mgmt Chapter of the Service Manual. This chapter will call for a single habitat mgmt plan for entire refuge, and eliminate the need for separate cropland, forest, water mgmt plans etc. Thus, Back Bay is already doing (on slightly smaller scale) what Service will be mandating in near future.

My only concern about the cropland mgmt program is that the refuge is formalizing this program at a time when many refuges should be looking at cutting back cropland mgmt to reduce snow goose use. Though, in Back Bay's case, they only receive a small amount of snow goose use each year.

If you want to discuss anything about the plan, give me a call.

Hal

Sue/Tony

We should develop Regional policy on the requirement that Refuge farming programs adhere to Integrated Pest Management practices. I know there is Service policy but it is broad + ill defined.